

# The Hydriatic Treatment

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## Typhoid fever.

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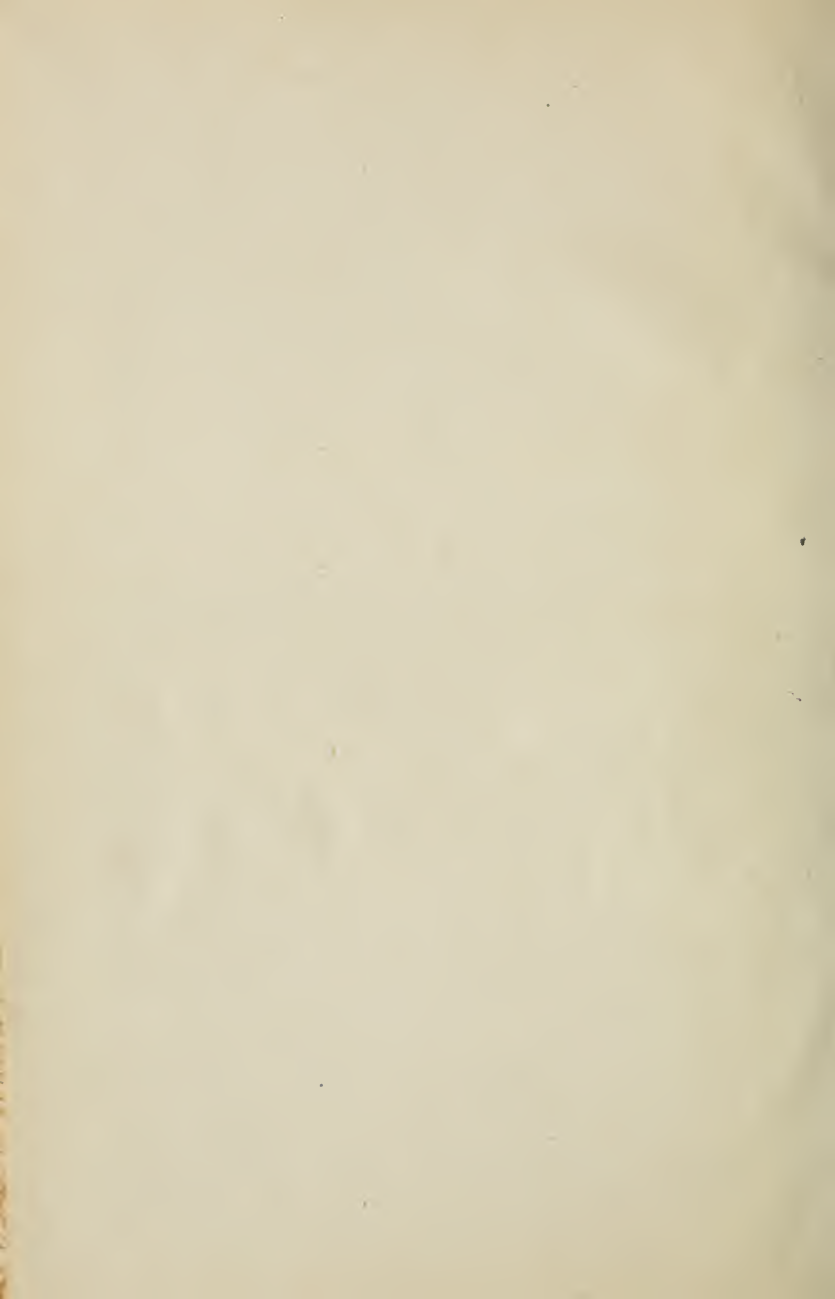
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THE  
HYDRIATIC TREATMENT  
OF  
TYPHOID FEVER

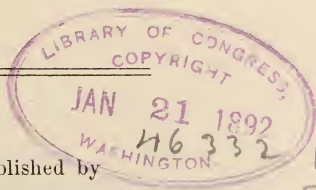
ACCORDING TO

Brand, Tripier and Bouveret, and Vogl.

BY

✓  
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Published by

CHR. SIHLER,

832 Scranton Ave., CLEVELAND, O.

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PC 187  
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Entered, according to Act of Congress, in the year 1891 by  
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PRESS OF  
PUBLISHING HOUSE OF THE REFORMED CHURCH,  
1134—1138 Pearl St. Cleveland, O.

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A 9  
"Brand as well as suffering humanity is under obligations to you for undertaking the introduction of this excellent method in your country."

From a letter of Dr. vogl to the author.

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"I have no doubt, that very many persons have died in the United States of typhoid fever whose lives would have been saved (by Brand's method) if the American medical profession had risen above the opposition of the laity and above its own prejudices."

From H. C. Wood's Therapeutic,





## PREFACE.



(1) In the first place I wish to thank *Dr. Brand, Drs. Tripier and Bouveret and Dr. Vogl* for allowing me to make translations from their writings. The physicians, who will follow the advice these men give, will, I venture to say, thank them twofold, and the patients and their friends benefited by their writings threefold. By these words I do not wish to imply that I subscribe to every single utterance in this book.

To *Dr. John H. Lowman* also, my colleague and friend, I am under obligations for aid and advice in the preparation of the manuscript.

(2) Any remarks of my own while translating the writings of my authorities are included in brackets, often with an S.

(3) The centigrade scale is used in this volume for thermometric measurements. In a great many instances the corresponding figure in the F. scale is added. For the instances where

this is not done I add further the following table giving the centigrade scale from 42 to 14° in the F. scale.

Celsius.	Fahrenheit.	Celsius.	Fahrenheit.
.....42.0 .....	.....107.6.....	.....30.....	.....86.0.....
.....41.5 .....	.....106.7.....	.....29.....	.....84.2.....
.....41.0 .....	.....105.8.....	.....28.....	.....82.4.....
.....40.5 .....	.....104.9.....	.....27.....	.....80.6.....
.....40.0 .....	.....104.0.....	.....26.....	.....78.8.....
.....39.5 .....	.....103.1.....	.....25.....	.....77.0.....
.....39.0 .....	.....102.2.....	.....24.....	.....75.2.....
.....38.5 .....	.....101.8.....	.....23.....	.....73.4.....
.....38.0 .....	.....100.4.....	.....22.....	.....71.6.....
.....37.5 .....	.....99.5.....	.....21.....	.....69.8.....
.....37.0 .....	.....98.6.....	.....20.....	.....68.0.....
.....36.....	.....96.8.....	.....19.....	.....66.2.....
.....35.....	.....95.0.....	.....18.....	.....64.4.....
.....34.....	.....93.2.....	.....17.....	.....62.6.....
.....33.....	.....91.4.....	.....16.....	.....60.8.....
.....32.....	.....89.6.....	.....15.....	.....59.0.....
.....31.....	.....87.8.....	.....14.....	.....57.2.....

(3) It may be of interest to note down here that the surface of the human body measures about 15 square feet.

(4) It will be noticed that in the introduction I say that the treatment of the complicated and neglected cases will be but lightly touched upon. After correspondence with Dr. Brand I concluded to treat this matter quite fully devoting 63 pages to this topic.



(5) I hope that the members of the profession of the English tongue will not be slow in following the example of their French confrères. The volume speaks about the introduction of the method in Lyon and how it steadily gained friends, it relates however also that at the time when the bulk of the profession in Lyons were already adherents to the method, in the academy of medicine in Paris *Dujardin—Beaumetz* announced that the method of *Brand* had been abandoned as useless, so that *Glénard* was obliged to protest against this statement adducing as testimony contradicting this announcement the declaration of 24 physicians of Lyons, see pg. 38. Now, however, a change must have overtaken the Academy, a change of opinion which has always followed the unprejudiced observation of the workings of the method. At least — so I am informed by Dr. Brand — *the Academy of Medicine of Paris has announced a prize of 5000 Frnks., for the best work on the hy-driatic treatment of typhoid fever.*

May this little book be of some aid in bringing about a change of opinion on the value of the Brand method in the United States (and

perhaps elsewhere) so that we, though slow in giving the method a trial, may not be the last ones whose patients derive the benefits of the hy-driatic treatment.

CHR. SIHLER.

December 10th, 1891.

832 Scranton Ave., Cleveland, O.

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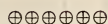
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## Introduction.



The purpose of this little volume is to induce and enable the medical profession of the United States to use the hydriatic method in the treatment of typhoid fever. I think that any one who should feel inclined to try the method, would feel the want of a book, which might enable him to become thoroughly familiar with the details of the method, to enter fully into the views of the masters of the art, to give him a rationale or at least a theory for its mode of action, to inform him about modifications necessary in special cases, to detail to him a number of typical, illustrative and unusual cases, and to state the results obtained by others. There are now in existence excellent books in other languages meeting such demands, the latest one by the French professors and physicians Tripier and Bouveret. Being convinced of the great value of the hydriatic method, and wishing the same to be employed amongst my countrymen, I inquired of six prominent medical publishers, whether they would be interested in the publication of the translation of a standard work on

this subject. All six declined, stating that such a book would not find a market, one of the answers being the following : “Dear Sir. — Replying to yours of the 12th inst., offering a translation of a work on the hydropathic treatment of typhoid fever, we have to say, that it does not seem to us that such a work would find a very receptive market. That form of treatment has been talked of and written on by many of our medical men ; but so far as we know it has not as yet been received with the enthusiasm which is necessary to warrant the publication of a work on the subject. Later on, perhaps, there may be a market for such a book.”

While the answers from the publishers were discouraging, showing the lack of interest in this question amongst the profession of the United States, they on the other hand were a source of stimulation to fresh activity, inasmuch as they revealed the fact, that there was here a chance for missionary work in a field which promised many good results. I therefore concluded to publish at my own expense a little volume presenting such points, as I myself, when undertaking the use of the method, was desirous of having access to, and which would enable any one to undertake and begin using the method. Tripier and Bouveret have kindly allowed me to make translations from their book and Dr. Brand

has sent me from his library books otherwise difficult to obtain.

The volume then is essentially a compilation (1) from the work of Tripier and Bouveret, *La fièvre typhoïde traitée par les bains froids*. Paris, Baillere et fils, 1886, the German translation of which by Dr. A. Pollak, (*Tripier and Bouveret, Die Kaltwasserbehandlung des Typhus*, Arnoldische Buchhandlung, Leipzig, 1889.) was used in the preparation of this work; (2) from Brand, *Die Wasserbehandlung der typhösen Fieber*, 2. Auflage, Tuebingen 1877, Lauppsche Buchhandlung, (3) from the writings of Vogl the most important of which have been published in the *Deutsche Archiv für klin. Medicin*, Bd. 36, 37, 43, 44 and in other journals. It would of course have been just as easy a task, if not easier, to use my own words in reporting the work of others, but those, who should feel inclined to use the book as a guide, will undoubtedly do it with more confidence, if they can read the *ipsissima verba* of masters in the art, and I hope this fact will not detract from the value and usefulness of the book. Undoubtedly there are other men more competent for this task. But when the Priest and the Levite pass by, without noticing a good thing along the roadside, the Samaritan may be excused for taking hold of the case. In my opinion a book of the kind I present here, should

have been made accessible to the medical profession of this country ten years ago, because Brand's second edition was published in 1877, and this book gave the results of over 8000 cases, the observations having been carried on over a number of years and by numerous competent observers, clinicians and private practitioners, civil and military physicians, the reports of all these observers speaking in favor of the method.

I myself had expected that such an authority, as the *American System* would at least have given an account of the method of Brand. It is true the article on enteric fever speaks of cold water in discussing the treatment. It is spoken of however as a remedy applicable when typhoid fever assumes a severe form as a kind of *dernier resort*, while Brand says that it is used and must be used *before* the disease has assumed a severe type, and that when it has reached that stage, the best chance for cold water to do good and produce its legitimate effects has passed by. "One of the first symptoms to demand attention," the article continues, "is the high temperature." But Brand advises the use of water just as well in the hypothermic forms, and where the temperatures are not excessive, and in his first edition on the hydiatic treatment of typhoid fever, he mentions in the *first* place those "stimulating" qualities of the cool



bath, by virtue of which all the favorable changes in the digestive, circulatory, nervous, etc. organs are brought about. Further, the article says that the hydriatic method depends for its efficacy upon its power of abstracting heat from the body and is useful just in proportion as it does this and that, and there is no reason for believing that it has the power to modify the conditions, upon which the production of heat depends, while Vogl and others have shown that even before the maximum temperatures show a decided decrease, there is a permanent amelioration of many or most of the symptoms, and that a steady and sure reduction of the maximum temperature from day to day can be brought about, this fact showing that the treatment has indeed a power to modify the disturbed heat-regulating organs and not merely to relieve the organism for a short time of the high temperature. Finally Liebermeister is mentioned as the guide and authority for the application of the method, but Brand says: “I am sorry to say, that I have to part company with Liebermeister, Hagenbach, Ziemssen and others, men towards whom I entertain the deepest feeling of gratitude and the highest respect. All of these men do not carry out the water-treatment systematically, as is generally taken for granted; they use a treatment into which both the antipyretics *and* water enter and they have

for their way of treatment different indications from those of the systematic water-treatment.”

I must protest then against the notion, that in the *American system* the hydriatic treatment of enteric fever is presented and explained in an adequate way ; its commendation is so half-hearted, that I think I remain within the province of truth when I say, that on the strength of the treatment it has received *there*, next to nobody will have made use of it. And then if one reads the objections mentioned on page 328, one certainly feels as though the method was mentioned with the purpose of advising others to let it alone rather than to employ it !

I cannot refrain from quoting a few lines more, to show how little the writer of the article has entered into the spirit of the method. “I am indisposed,” he says, to have recourse to it (the cold bath) except in cases of hyperpyrexia of such intensity, that death seems imminent and only to be averted by energetic treatment, or in cases in which other antipyretic remedies have failed to reduce the temperature, and for the following reasons: 1. In the first place it is generally possible to produce a decided effect by the other methods of applying the cold water treatment with much less discomfort to the patient. 2. In a private house it is not always practicable to have a bath brought to the bedside of the patient, and

in a general hospital to do so would occasion a good deal of annoyance to the other patients in the same ward, and I have seen ill results from carrying him some distance to the bath room. But even where the bath is brought directly to the bedside, it involves so much movement and is sometimes the cause of so much excitement, that its good effects are more than neutralized by its bad."

I think he, who will study the writings of men who have had much experience in the use of the cool baths, or he, who will try the method himself faithfully, will support me in my statement. If one should in describing the antiseptic method of treating wounds, fail to speak about cleaning the field of the operation, say nothing about clean sponges and instruments, if he should allow the wound to be plastered up as in old times, and only then, if the wound were surrounded by phlegmonous inflammation and the patient suffered from high fever, advise the opening of the wound and washing the same with antiseptics,— he would do as much justice to Lister as the *American System* has done to Brand. To my mind it is certain that such a presentation of this important method has done very little or nothing to propagate the use of the cold bath treatment in the United States.

The profession then lacking a convenient

book illustrating the method, I have not considered it out of place to issue this little volume, especially if it is true what H. C. Wood says: "I have no doubt that very many persons have died in the United States of typhoid fever whose lives would have been saved (by Brand's method), if the American medical profession had risen above the opposition of the laity and above its own prejudices."

How many then do die? In the census of 1880 Dr. Billings gives the number of deaths from enteric fever as over 22,000. Now it has been found, that where the method has been carried out without any claims to great accuracy the mortality has been reduced 33 per cent, and where it has been carried out systematically the rate has been reduced 66 per cent, and where the physicians had the aid of the public (by their reporting early and following the directions closely) the rate has been reduced 90 per cent and more. Using the lowest figures it may be said that 7000 lives might be saved (not to speak about the comfort to many more thousands) in the United States per year. Here in Cleveland we lost from typhoid fever 180 persons in each of the last two years, and in the few years that I have been connected with a medical school here, four students and one recent graduate have died from the disease. A further incitement to

use all means at our command is the fact that persons in the best years of life are the victims and that the treatment will restore the patients to full health and vigor.

It is my hope then, that a good many lives will be saved if this little book will be read and the advice it gives, followed. May it be the fore-runner of a larger and more comprehensive publication "later on," e. g. a translation of the work of Tripier and Bouveret to which I would refer the reader, who wishes more thorough information. Brand's work mentioned is out of print. It is to be regretted, for it would be read with pleasure on account of its freshness. Vogl's writings let us hope will be published sometime, if for no other reason than to show how all observers who employ the method, reach the same results.

Dr. Brand the author of the method is in private practice in Stettin, and his example ought to be sufficient to show that the method can be carried out in private practice, and that here is the very best field for its operation. Tripier and Bouveret are professors in the medical school of Lyons, France, and their book is based upon the study of 233 cases. Vogl is Oberstabsarzt in Munich and has been using the method for over 15 years in a most thorough manner particularly amongst soldiers.

•



The book consists of 4 chapters, and appendix A. In the I. chapter the results that have been obtained so far with the hydriatic method are presented. In the II. chapter the effects of the treatment on the various functions, organs and symptoms, as the temperature, nervous, circulatory system are given, thus furnishing a *rationale* for the statistics. In this chapter Vogl as well as Tripier and Bouveret are allowed to speak on the same subject and their uniform experience will, I hope, not fail to make an impression on the reader. In the III. chapter the indications are given and the method is described; here Brand and T. and B. have been followed verbatim for the most part. Lack of space did not allow me to follow this method, when treating of the special conditions. Chapter IV. contains the histories of a number of cases, five after T. and B. and the rest after Brand. T. and B. have in their work described the treatment from beginning to end in a supposed case, to illustrate the execution of the same. I think a careful study of these actual cases, where every measurement and every bath is reported, will answer the same purpose and will give a very accurate idea of the execution of the method. These cases have been selected to show a variety of forms, complications and difficulties and I hope this selection of cases may be useful

in practice. In appendix A I have allowed myself to add a few words on my own observations and to present a few reflections derived therefrom.

## CHAPTER I.

Why are we justified in employing the Brand method or cool baths in the treatment of typhoid fever?

If we stop to ask ourselves why we employ certain remedies or follow certain lines of treatment, we have I think on the whole two answers to give: and these may be best given by using illustrations. Thus if I were asked why I use quinine in malarial attacks I should say, not because I have any theory as to how quinine acts, or any very definite knowledge of the cause of the malarial attacks, but because the giving of quinine has in so many cases been followed by amelioration of the disease, that I cannot any more believe that we have here a simple *post hoc*; it would be too improbable. If I were however asked why I give milk and alkalies in ulcer of the stomach, nutritive enemata, prohibit the use of food, and prescribe opium, I should say that from their physiological action on the several conditions prevalent, I would expect *some* good (more or less) certainly to accrue to my patient from the remedial agents, and in many cases a healing of the ulcer. As a matter of fact and not much to the credit of rational medicine, just for those

very remedies and lines of treatment which are the most certain, useful and reliable we have either none or very insufficient reasons and in fact nothing but the *post hoc*, but a *post* of such a formidable nature that it equals a *propter*. Now in my opinion we can give for the employment of the cold water treatment both kinds of answers, we can say that under its use the mortality has been decreased so often and with such regularity, that we cannot any longer close our eyes and ears to this recurring coincidence, and in the second place the employment of the cool bath has such a favorable influence on the special symptoms and the functions of the different organs, that it cannot be otherwise than that the final result must be influenced for good by its employment.

While the second chapter of the book treating of the influence of water on the special symptoms and on the course of the disease will thus also be answer to the above question heading this chapter,—this I. chapter will be devoted principally to statistics showing what results have been obtained under the Brand treatment.

The American, or in fact any other physician, has in my opinion no difficult task to make up his mind as to the value of this method, in as much as it has been on trial now for thirty years. In 1861 Brand, who has put the method

on an accurate or scientific basis, giving method and indications and very good provisional theories for its use, published his first work on this subject. At that time one certainly might have hesitated, as long as there was merely the testimony of the author of the method, upon which to base ones judgment,—because originators of new lines of treatment are apt to be so enthusiastic over their intellectual child, that they cannot see its faults and weaknesses, but at present the number of those having given the method an impartial trial has been so large, the time, 30 years, during which the method has been exposed to criticism and trial so long, that we should have no difficulty in coming to some conclusion as to its value. In this first chapter then I shall give the statistics of typhoid fever as influenced by the water-treatment:

(1) of the military hospital of Munich.

(2) of the military hospital of Stettin and the II. German army corps, Stettin being the headquarters of the same.

(3) the results observed in the German army, comparing its mortality with other armies.

(4) the experience of French observers.

(5) the experience which the hydriatic method had amongst children.



(6) the gross available results of the method, comparing it with gross results of treatment in different hospitals and countries, other than hy-driatic.

(7) the experience of those men, who have carried out the method in the most thorough and systematic manner and who were so situated and inclined to treat their cases from the very beginning of the sickness, thus showing what the method can do under the most favorable circumstances.

In 1885 Vogl published in the *Deutsche Archiv fuer klinische Medicin*, Vol. 36 an article entitled: *Typhus Therapie im Muenchener Garnisonlazareth* containing the statistics from 1841 to 1882 ; it contains the number of cases treated, the morbidity per thousand, the mortality per thousand as well as the percentage of deaths. I give this as table No. 1 in a condensed form.

TABLE I.

Showing No. of cases of typhoid fever in military hospital of Munich from 1841 to 1882 with No. of deaths, percentage of deaths rate of morbidity and mortality per 1000.

	Typhoid.	Deaths.	Mortality percentage.	Morbidity p. 100.	Mortality p. 100.
1841—43	.....402	.....144	.....35.8	.....45.1	.....16.0
1844—47	.....374	.....69	.....18.4	.....28.3	.....5.2
1848—51	.....897	.....192	.....21.4	.....38.9	.....8.6
1852—55	.....977	.....227	.....23.2	.....44.6	.....10.4
1856—59	.....1446	.....240	.....16.6	.....71.0	.....11.6
1860—63	.....621	.....127	.....20.5	.....27.9	.....5.6
1864—67	.....767	.....139	.....18.1	.....32.0	.....5.0
1868—72	.....900	.....124	.....13.8	.....37.1	.....5.0
1873—76	.....953	.....159	.....16.6	.....39.1	.....6.3
1876—80	.....783	.....57	.....6.4	.....29.3	.....1.8
1880—83	.....105	.....8	.....6.8	.....6.8	.....0.5

Vogl divided it into two periods.

A. the time before the cold water treatment 1841—1868. 5484 cases—1138 deaths.—20.7 per cent mortality.

B. the time after the introduction of the cold water treatment 1868—1882. 2841 cases, 348 deaths.—12.2 per cent mortality. Difference 8.5 per cent mortality.

The treatment during the first period (A) was exclusively by medicine (cathartics, emetics) and bloodletting in the first years, while in the last years from the beginning of the fifties it was antipyretic and stimulating: quinine, wine, baths.

The treatment during the period resembled in its beginning for the most part that of the,

latter part of A, the baths being exhibited rather sparsely. Only since the middle part of the seventies cold water was used more extensively, partly combined with quinine, salicylate of soda, partly however the Brand method was carried out systematically. 132 lives were saved."

Inasmuch as there may be prevalent in the minds of many the notion that if there are a great number of cases of a disease, there will be also a high percentage of deaths, it will be worth while to call attention to the figures in this table which show that in 1856—59 when an epidemic was prevailing and the morbidity was a very high one, the percentage of deaths to the number of cases was very low. Objections have been made to assigning the very low mortality prevailing under hydriatic treatment to this method by calling attention to the fact, that the disease has become rarer and consequently milder, but this table shows that such an argument is not sound; there is no correspondence between morbidity and the benign character of the disease.

Here I should like to say a few words on the great scientific value of statistics obtained in military hospitals. In the first place the mortality from typhoid fever amongst soldiers is naturally a high one (Brand) being as high as we find it in persons of more advanced years of life.

A low percentage of deaths to the number

of cases treated will thus be of a good deal of significance. Further we all know that one of the many difficulties in forming an opinion of the value of any therapeutic measure is that the material which is subjected to the same treatment by different observers and in different periods of time—is not of the same character, thus always opening the door to the legitimate doubt whether any given result depends more on the character of the material (the patients) than on the nature of the remedy. Now in the case of soldiers we have persons of the same age, all of good constitution, of the same occupation, the same mode of living, diet, the source of infection (in any single period) being also the same. We can therefore in this case with more accuracy compare different years, and on the other hand any method has a better chance to be carried out systematically because the soldiers being under medical supervision come under treatment early and on account of the spirit of discipline prevailing amongst them such a method especially as the hydriatic will be more apt to be carried out thoroughly. Hence the great value of statistics amongst soldiers.

But the value of the hydriatic treatment becomes more apparent by a further analysis of the facts. I shall quote Vogl himself; he says: “In the military hospitals at Munich the rate of mor-

tality in the period B, after introduction of the cold water treatment was, (as remarked above) 12.6 per cent, 8.5 per cent less than in period A. This proportion cannot be satisfactory to any one, who knows by experience the efficiency and power for good of the water treatment. The figures here do not represent the rate of mortality under a systematic application of the hydropathic method: an average rate of 12.6 per cent must be brought about by high figures obtained under some other method; this is indeed the case, inasmuch as during the earlier period a case now and then only was subjected to Brand's treatment. It will therefore be of importance to isolate a series of cases which have been treated strictly and methodically, and to place them opposite, and compare them with a number of cases treated differently. The arrangement in the military hospital in which the medical cases are treated in two stations makes such a comparison possible. In these two stations the house physicians are replaced by new ones on October 15th of each year, and the patients are distributed in such a way that one is taken to Station I. and the other to Station II.; in both stations they have the same wards, frame pavillions and nursing, so that we have here material for comparison so much alike in regard to time, locality and individuals—as perfect as one



could possibly desire. Different results in the number and completeness of recovery can therefore be reduced by different forms of treatment only. Although the (hydriatic) method of treatment had been in vogue here since 1869 it was more of an experiment, of the results of which no reports exist which can be utilized for our purpose. It is only since 1876—77 that accurate histories of cases are in existence describing the treatment in the different stations and the different years. Since then typhoid fever cases were treated with cold water in both stations, with a difference in the energy and thoroughness of the execution of the method. Hence it seems in place to divide the whole material into two great groups, accordingly as the treatment was (A) a strictly methodical one, according to Brand: a bath of  $12^{\circ}$ — $14^{\circ}$  R., of 15 minutes duration, when the body temperature reached  $39^{\circ}$  C. measured in the rectum; without any medication—place of treatment, hospital pavilions only, or (B) one deviating more or less from the formula of Brand, both in respect to intensity and duration of the abstraction of heat, combined with the exhibition of antipyretic remedies, place of treatment in pavilions during the summer only.”

“In making such a division we cannot make comparisons between the cold water treatment on

the one hand and expectative or medicinal treatment on the other hand, but only between a perfect and an imperfect method of abstraction of heat, a circumstance which increases the precision (Schaerfe) of the comparison.

“The relation between therapeutics and mortality can be laid down in a few theses:

1. Almost in every year the therapeutic results in the two stations differ; being two, three and four times better in one than in the other.

2. In spite of the greatly lessened mortality *in toto* in comparison with the former years, we find here the rate of mortality as high as 10.8—18.8, as high as in more than half of the years of the period of 1841—1868.

3. This equality with the results of former years we find on the side of the combined method of treatment only.

4. The strict and systematic hydriatic method with an average of 2.7 per cent never exceeds (even in years with many cases of typhoid fever) the rate of mortality of 4.7 per cent, a figure to which the rate never sank in the years from 1841 to 1868.

5. The combined hydriatic method occupies a place between the results of a former method of treatment and the strict method of late years, never reaching the highest figures of the former, 30 per cent, and never sinking to the lowest

figures of the latter, 0. per cent. This method approaches in its results more the older than the method of to-day.

6. The total decrease of the mortality rate in the military hospital in 1876—1882 compared with the period from 1841 to 1875 is brought about principally by the reduced rate of the strictly systematic cold water treatment.

A further explanation of these figures, the language of which one cannot designate as “enthusiasm” I consider unnecessary.

TABLE II.

Showing No. of cases and rate of mortality in the military hospital of Munich from 1875 to 1882.

	Station.	No. Cases.	No. Deaths.	Mortality.	Treatment.
1875—76	I.	76	12	15.8	Combined ..
	II.	66	3	4.5	Pure.....
1876—77	I.	194	13	6.7	Combined ..
	II.	141	5	3.5	Combined ..
1877—78	I.	77	3	3.8	Combined ..
	II.	56	0	.0	Pure.....
1878—79	I.	115	7	6.1	Combined ..
	II.	92	14	15.2	Combined ..
1879—80	I.	110	12	10.8	Combined ..
	II.	98	3	3.9	Pure.....
1880—81	I.	16	3	18.8	Combined ..
	II.	25	1	4.0	Pure.....
1881—82	I.	22	2	9.1	Combined ..
	II.	42	2	4.7	Pure.....

The combined method has 767 cases, 59 deaths, 7.6 per cent mortality.

The pure method has 221 cases, 6 deaths. 2.7 per cent mortality.”

In 1889 Vogl published another essay on the same topic; here we read: “I am able to add to these favorable results those of the years following. We have not exceeded (with the exception of a few tenths in 1885 — 1886 ..... ) the rate of 4.7.

We had in —

1882—83 a mortality rate of 2.9 per cent.

1883—84           “           “   0.0   “

1884—85           “           “   4.1   “

1885—86           “           “   5.1   “

1886—87           “           “   4.0   “

The number of cases treated was 141, the average mortality rate 3.5. Of no little importance is the increase of the strictness of the hydriatic method in Station I. together with the abstention from internal medication.

In Station I. we had in —

1882—83 a mortality rate of 5.0 per cent.

1883—84           “           “   4.5   “

1884—85           “           “   2.8   “

1885—86           “           “   4.7   “

1886—87           “           “   4.0   “

The number of cases treated was 144, the average mortality rate 4.1 per cent.

Adding the cases of both Stations we find cases 1273, deaths 76, giving a mortality rate of 6 per cent.”

This rate of 6 per cent however does not do full justice to the water treatment, inasmuch as it contains cases not treated strictly. Comparing it with the old rate of 20.7 we can see its value. Let us also remember that these low figures have not been a lucky accident occurring in one or two years, but that the observations have been carried on for 12 years and more. Let us further take notice of this fact, which stands out wherever the method has been used, that when the method was carried out partially the good results were only partial, and that strictly with the more perfect carrying out of the same there went hand in hand the decrease of the rate of deaths; we cannot therefore appeal to chance in explaining the coincidence of the use of Brand's method and the decrease in the deaths from typhoid fever.

A further evidence in the same direction Table No. III. showing the No. of complications under the strict treatment and the combined treatment.

TABLE III.

Showing the per cent of complications.

Complications.	Combined method.		Pure method.	
	No.	Per cent.	No.	Per cent.
Bronchial affections..	128	16.6	21	9.5
Croupous pneumonia	9	1.1		
Laryngeal affections.	26	3.3	11	4.9
Pleurisy.....			1	0.4
Erysipelas.....	16	2.0	1	1.4
Epistaxis.....	17	2.2	4	1.8
Affect. of ear.....	68	8.8	8	3.6
Cerebral affections..	40	5.2	2	0.9
Profuse sweating....	145	17.6	9	4.0
Venous thromboses..	30	3.9		
Decubitus.....	20	2.6	6	2.7
Peritonitis (simple)..	25	3.2		
“ with perforation	4	0.5		
Intestn'l hemorrhage	3	0.3		
Relapses.....	21	2.7	2	0.9
Neuralgia of toes.....	10	1.3	5	2.2

We now pass from Munich and the southern part of Germany to Stettin in the northern part. Stettin is the city where Brand lived and labored (and still lives) and where he could make his influence felt not only by his writings but by example and personal contact. We might therefore expect that here we ought to see also in a conspicuous manner the good results of the Brand method if any such it should have to show. The statistics of the typhoid fever here while not as complete and detailed as those of Munich are still of much value and very interesting, because we have figures from the period



before the water treatment was employed and others from the period when the Brand method was carried out.

Table IV. shows the rate of mortality and No. of cases and we can see that the typhoid fever prevailing in this locality was by no means of a mild type, the mortality reaching 37 and coming down to 15 as the lowest figure. This table is also of interest because it again shows as did the Munich tables that a high morbidity, or a great No. of cases in a year go together with a low percentage of deaths. Thus in 1853 when the highest number of cases is recorded we have a mortality of 18.5 per cent which is only one half of 37 the highest percentage on the list and, curiously enough the year having the smallest number of cases, 48, has the high percentage of 31.2. I exclude the war year of 66.

TABLE IV.

Showing No. of cases, deaths, and rate of mortality in the military hospital at Stettin from 1849—1866 (excl. 65).

Year	No. of Cases.	No. of Deaths.	Rate of Mortality.
1849 .....	73	22	30.3
1850 .....	78	29	37.2
1851 .....	161	38	22.8
1852 .....	196	32	16.2
1853 .....	211	39	18.5
1854 .....	136	34	25.0
1855 .....	64	17	27.0
1856 .....	145	38	26.2

TABLE IV.—CONTINUED.

Year.	No. of Cases.	No. of Deaths.	Rate of Mortality.
1857 .....	143	42	29.4
1858 .....	176	55	31.2
1859 .....	208	59	28.5
1860 .....	85	24	28.2
1861 .....	83	23	27.6
1862 .....	53	15	28.3
1863 .....	48	15	31.2
1864 .....	74	20	27.0
1866 .....	36	19	47.3
.....	1970	519	26.3

I now quote from an address by Dr. Strube held March 21, 1878 in the *militär-ärztliche Gesellschaft* in Berlin. "This enormously high rate of mortality sank in 1865 suddenly to about 8 percent. In this year Herr Oberstabsarzt Loewer introduced the cold water treatment of Brand while at the same time he had a chance to treat his cases in tents. When then in 1866 on account of changes in the professional *personel* and other abnormal conditions the cold water treatment was discontinued (it was the year of the Austro-Prussian war) out of 36 cases of typhoid fever 17 died = a percentage of 47.3. In the following year when Herr *Oberstabsarzt* Scheide-  
mann and amongst others I myself had charge of the medical wards, and the typhoid fever cases were again treated with cold water the rate of mortality was between 7 and 8 per cent a figure which remained constant for some years,

but was reduced still further in later years when the Brand method was carried out with greater thoroughness. In the year 1873—74, according to the sanitary reports, all the cases occurring in the garrison of Stettin, 21 in number recovered — a mortality rate of 0 per cent. I have reports on an epidemic of typhoid fever raging in Stettin from November '77 to March '78, which furnished to the medical wards of the military hospital 66 cases of typhoid fever. These were treated by *Oberstabsarzt* Kuhrt strictly according to Brand and Liebermeister and all the 66 cases recovered; here again we had a mortality of 0. per cent.

Brand says that in the years 1867—82 there occurred in the Stettin military hospital 257 cases with one death which also represent a mortality of less than 1 per cent. We see thus that here also the reduction of the death rate from typhoid fever has been unbroken and that it has decreased with the more thorough and systematic use of the cold water treatment.

Of interest are further the reports of the second German *Armee corps* of which Stettin is a part. I again quote Strube: "Through the kindness of the war department, I am able to make some communications on the typhoid fever statistics of the second *Armee-corps* for the year 1876—77 and wish to remark that in the majority of the hospitals the treatment is that of

Brand. During the winter a mortality of 7.2 per cent and during the summer of 5.48 is reported, 7 deaths occurring in the latter period amongst 108 cases. But if from these seven deaths three are eliminated, viz.: one case in which adhesions were found due to former peritonitis; one case where the post mortem examination revealed acute miliary tuberculosis, and one case which was treated for 14 days elsewhere, without going to bed, the patient dying suddenly 2 days after admission to the hospital, from profuse intestinal hemorrhage, there remains a mortality of only 3.7 per cent.”

The following table gives for one year, (1873—74?) the typhoid fever statistics of the whole army by *Armee-corps*. It is of the highest interest, because it shows the difference between the results where the method was carried out thoroughly and where not so thoroughly. Although it can be gathered from the reports that the water has been employed in all the corps, yet in the second corps the water treatment has been carried out accurately after Brand’s formula. I think the observations that can be made here have almost the value of a laboratory experiment.

The following facts also are worth mentioning here. “In 1866,” Brand says, “during the war there died here, in Stettin, in the military hospital 48 per cent, (treatment without water);

under circumstances not any more favorable I have during the war of 1870—71 lost only 4.5 per cent of my soldiers, whom I treated with water.”

TABLE V.

Showing No. of cases of typhoid fever, deaths and percentage of deaths of Prussian army for one year ('73—'74) in the different corps.

Corps.	No. of Cases.	No. of Deaths.	Percentage of Mortality.
XIII.....	19	6	31.5
I.....	132	27	20.5
VIII.....	95	19	20.0
V.....	139	24	17.2
IV.....	91	17	16.4
Guards.....	137	22	16.0
III.....	75	11	14.6
IX.....	138	18	13.0
X.....	171	19	11.1
VII.....	238	25	10.5
XI.....	237	25	10.5
VI.....	284	24	8.4
II.....	160	6	3.7

The preceding communication dates from 1878. In 1887 Brand writes: “The mortality from typhoid fever in the second (Pomeranian) *Armee-corps* is of the highest interest. It amounts to 4.3 per cent while the average mortality (from typhoid) of the whole German army is 8.3 per cent.”

We see that with the more thorough employment of the hydriatic method the mortality in the whole German army has been reduced

from 13.5 to 8.3, yet the second corps for reasons stated has still the best reports.

According to Brand there died in the Pom-  
eranian military hospitals (second corps) in

1882—83 out of 477 cases  $17 = 3.56$  per cent.

1883—84 “ 429 “  $28 = 6.53$  “

1884—85 “ 392 “  $14 = 3.57$  “

1885—86 “ 188 “  $6 = 3.19$  “

Brand exclaims: “A typhoid fever mortal-  
ity in the hospitals of the second corps (where in  
former years the very highest figures prevailed)  
of 3.2! who would have dreamed of such  
things?”

(The year 83—84 with the higher mortality  
rate Brand looks upon as exceptional.)

In the military hospitals of the second corps  
there occurred from 1882—85 2711 cases with  
117 deaths, a mortality of 4.3.

I pass now to a consideration of the typhoid  
fever mortality of the whole German army.  
First however let us see what the mortality rates  
are in other armies.

The percentage of deaths from typhoid fever  
(Brand) in the

French army was (1882) 32.2 per cent.

Italian “ (1874—78) 28.36 “

Austrian “ 27.4 “

English “ (1882) 23.8 “



“According to Riecke (in Tripier and Bouveret) the average rate of mortality from typhoid fever in the Prussian army was from 1824—44 was 25.8 per cent; from 1867—74 (excluding the war time) 15 per cent. From 1874 on there followed in the German military hospitals a more general use of the cold water treatment, and since then a remarkably regular decrease of the mortality. This can well be seen in the following table giving the morbidity and rate of mortality of the Prussian army.

The official sanitary report 1879—1881 points out that the mortality has been reduced from 25 per cent to 8.3, thanks to the Brand method.”

We cannot be surprised then if 14 of the *Generalärzte* of the Armee corps have expressed themselves in favor of making the method obligatory.

TABLE VI.

Giving morbidity and rate of mortality in Prussian army from 1874—1880.

Time.	No. of Cases.	Deaths.	Rate.
1874.....	2735	329	12.0
1875.....	3620	408	10.9
1876.....	2747	298	10.8
1877.....	2081	206	9.8
1878.....	2112	190	8.9
1879.....	1741	163	9.4
1880.....	2534	226	8.9

While a reduction of a mortality from 25 per cent to 8.3 per cent would seem very satisfactory to most people, Brand, recognizing the fact, that in the second corps the mortality is only  $\frac{1}{2}$  of that the rest of the army, is not so well satisfied. Discussing this matter he says: "I know, however, as well as any one else, and perhaps better, that not all of the military physicians by far, carry out their treatment according to my directions, that, with the exception of the second corps, the confusion in their views and their methods of treatment, is as great as amongst the general practitioners. How various the treatment is carried out, I have described more accurately in the second edition of my monograph. Inasmuch however as the statistics of the hydriatic treatment only suffer on this account, nobody will object to insert the high figures of the military hospitals into the statistics."

The preceding figures from the military hospitals referred to times of peace only. In the war of 1870—71 there was occasion to give the method a trial under other conditions. As might be expected, the mortality under medical treatment was exceedingly high in those years.

In Paris.....	60.8 per cent.
Around Paris.....	27.0 per cent.

In Rouen.....38.4 per cent.

In Vigny (?).....18.1 per cent.

The average was (excluding Paris) 27.8, in the Bavarian Army 24.1.

The following figures are those obtained under the hydriatic treatment.

Strube reports a mortality of 12.9 per cent.

Schönheider      “                      “                      3.6                      “

Weidner              “                      “                      6.5                      “

The number of cases was 508, the number of deaths 44—a mortality rate of 8.6 per cent.

Taking the results from all the reports, (cases treated in France and Germany during the war) it is found that there were treated 1308 cases with 149 deaths = a mortality rate of 11.4 per cent to be compared with 27 and 24.

The results so far communicated obtained under the hydriatic treatment have all been obtained from German physicians and German patients. Let us now pass to France to see whether we shall hear of similar reports there.

Brand, in his essay: On the present status of the hydriatic treatment of typhoid fever ..... has a number of interesting passages, telling how the method was introduced there, how it gained friends, how it is carried out, what our colleagues there think of it and what they are doing in this matter.

“Surveying the literature (on the hydriatic treatment of typhoid fever).....one will be surprised to notice, that the center of gravity of the hydriatic treatment of typhoid fever, wishing to have understood once for all by this the method as advised by myself (Brand) has been transferred from Germany to France, or more correctly to Lyon. Amongst 58 communications 28 were written by French authors.”

“It does not take long to find a reason for this. While up to the first years of the seventies there was a rather close adherence to my directions and it was the systematic water treatment which was carried out. German observers have in the last ten years not been able to resist the inviting but erroneous idea that all that was necessary for the cure of typhoid fever, was to keep down the temperature, especially as the antipyretic remedies increased not only in numbers but also in promptness of action. My warnings in my monograph (p. 21) as well as in the article *Salicyl or water treatment?* (*Deutsche militärärztliche Zeitschrift* 1876. 6) has restrained but very few physicians from leaving the hydriatic method and adopting the antipyretic method. And during the prevalence of the antipyretic rage nobody has had time nor inclination to develop the hydriatic method further.”

“In France matters are different. In Lyon

typhoid fever is endemic, the rate of mortality is considerable (20—25 per cent) and on that account it was to be expected that the Brand method introduced by *Francois Glénard*, who had become acquainted with it as a prisoner of war, was received favorably. In the beginning there was no lack of adversaries, in fact the physicians of Lyon were divided into two camps, the “Brandites” and “Non-Brandites”, but the tireless exertions, and the power of the facts and conviction finally succeeded in the course of time to win over all the physicians of Lyon, with a few exceptions, so that Gnoux (*Le traitement de la fièvre typhoïde a Lyon en 1886*) could write:

“Typhoid fever is the one of all the febrile diseases, which we fear the least. When once a case is being bathed, we neither apprehend surprises nor look for complications, we prefer it a hundred times to the whooping cough and even to the measles. In one word as Glénard has expressed it, we have the disease in our hands, and if there were a proof lacking of our conviction, there could be no better one offered than that if we, physicians, or one of our family, are affected by a febrile disease, it is typhoid fever which we prefer, and our whole care is to interfere early enough with the baths. One will look around in vain to be able to cite a physician of Lyon, who will act otherwise in his own case,

or that of his wife, or his children, and in the heavy tribute which medicine (the profession) in Lyon has paid to typhoid fever during the last 12 years one will look in vain for a case not proving successful. Finally, this practice of the physicians is known through the declaration of 1883, where they testify that they use the Brand method in their own families, in their private and hospital practice.”

“A better testimony has never been given to support the therapeutics of a dangerous disease, as long as scientific medicine has been in existence, and the fact that it was given in 1886, and in France, certainly does not detract from its value; I think it even does honor so much more to him who has given it, as to its author.”

After treating of some other matters, Brand continues: “As has been remarked, Mr. Glénard became acquainted with the method while as a prisoner of war he acted here as my assistant in 1870—71, and soon after his return had occasion to practically demonstrate the same to his colleagues in Lyon. When in 1873 an epidemic of typhoid fever broke out there, he described the method in the “Lyon Medical” in its main features, and treated in the Hospital de la Croix Rousee under the eyes of many physicians, 51 cases, losing but one which came under treatment in a late period



of the disease. On the strength of a report by Mr. Rollet the procedure was adopted as well in private practice as in the other hospitals of Lyon, but under the false presumption, that it was adapted only to the grave cases. Nevertheless the result was a satisfactory one.....Glénard however is not a man who would allow these erroneous notions concerning the method to prevail. A man of scientific and general culture, highly gifted and energetic, mighty with pen and speech, self-sacrificing, faithful, and polite, he made all exertion to be, as he had promised, a champion of the Brand method in his home. He has more than kept his promise.....

In a series of articles for journals which appeared also as pamphlets.....he has delivered the method in a short, precise, and elegant style, so that the translation of my monograph was superfluous and the majority of the physicians of Lyon became adherents of the method. As a proof of this statement I may mention the fact that when *Dujardin-Beaumetz* in the *Academie de Médecine* spoke of the method as useless and abandoned, of 24 clinicians and hospital physicians 22 subscribed to the following declaration: "The hospital physicians declare themselves partisans of the method of Brand in the treatment of typhoid fever, convinced that the method regularly applied from the beginning of the disease

will reduce considerably the rate of mortality. They testify that they employ the same in their own families, in their hospital service and in their private practice.”

With this declaration Glénard went to Paris and had Mr. Bouley lay it before the Academie where, of course, it called forth a great storm.”

But Glénard has not only succeeded in convincing his fellow citizens of the soundness of the principles of the Brand method, especially regarding its prophylactic importance, but also (and this is of the highest importance) to save them from starting out on the wrong way of antipyretics. In Lyon the accepted treatment is that of Brand, and all the variations and abnormalities of the water treatment, such as are customary in Germany, are unknown there.”

On the basis laid down by Glénard, Tripier and Bouveret have produced a work, an honor to themselves and a blessing for the whole world—provided that it will find readers, who will follow the directions it contains, which has not been the case with my monograph in Germany. Both professors, clinicians, and hospital physicians at the same time, have tested—*sine ira et studio*—the various points of the Brand method with the aid of a rich material and have published their results in a monograph entitled: *La fièvre typhoïde, traitée par les bains froids*, 1886, Paris

Baillière et fils. Although 635 pages in length this excellent work does not contain one superfluous word. The problem which the authors undertook to solve was an unusually difficult one. It was not so much the point to demonstrate that the mortality of typhoid fever was less under the hydratic treatment, than under any other—this has been done by others so often, that it requires no further proof; the main aim of the authors was to examine (1) whether the indication which has been laid down by me is the right one. (2) whether the treatment fully meets the indication. (3) whether the evidence which I have presented will bear a closer examination, and whether the conclusions based upon them are correct.

Following such a plan only could they hope to attain their purpose, to make it possible to the medical profession everywhere, to form an opinion on the value and nature of the water treatment, and to learn to adopt and carry out the method in practice, without being in danger of being obliged to desist from using it in the case that difficulties should arise, or in discussions to make statements, which are at variance with all physico-physiological relations.

That such a labor cannot be set forth in a few pages is self-evident. This aim however they have reached in a brilliant way.”

After listening so far to Brand on the fortune of his method in France, let us see what French observers have to say. I select the experience in the *Hopital de la Croix-Rousse*, and quote Tripier and Bouveret." The statistics of the Hopital de la Croix-Rousse begin in 1866 and end in 1885, the years of the war, however (1870—71) being omitted, it comprises a period of 18 years only, we divide this period according to the method of treatment into 3 periods. Every period is so long that the objection of epidemics of variable malignity does not hold good.

I. The first period extends from 1866 to 1872, during which cool baths have not been thought of. All typhoid fever cases were treated with medicines or expectatively exclusively. Under this treatment out of 229 cases 60 died, yielding thus a mortality of 26.20 per cent.

The following table gives the No. of cases of typhoid fever, the No. of deaths and the rate of mortality per cent.

1866,	33 cases,	10 deaths,	30.30 per cent.	
1867,	62	17	27.41	"
1868,	40	11	27.50	"
1869,	56	14	25.00	"
1872,	38	8	21.05	"

The annual mortality and the mortality of the five years together, are about equal to the

average mortality of our hospitals before the introduction of the hydriatic method. This can be estimated as 25 per cent.

The years of 1870—71 show in the Hopital de la Croix-Rousse a very high mortality:

1870, 69 cases, 37 deaths, 53.62 per cent.

1871, 38 “ 18 “ 47.36 “

..... Adding these 2 years to the 5 of our first period the mortality rises to 34.22 per cent. As a matter of course, this relation, brought about by a great number of cases of unusual gravity does not afford a correct notion of the average mortality from typhoid fever in the Hopital de la Croix-Rousse. We have therefore excluded these two years. From our standpoint the exclusion is not altogether justified. If the ordinary method of treatment shows its impotence in grave epidemics, this is not the case with the hydriatic method. Even under such the same is able, if applied systematically, to reduce the mortality quite considerably.

II. The second period comprises 9 years from 1873 to 1881, during which 104 patients died out of 629, the mortality being 16.53 per cent. The decrease in the mortality is indeed quite remarkable: 26.20 per cent in the first period, 16.53 per cent in the second, which means a reduction of the mortality of one-third.



In the second period the Brand method was not carried out systematically. It was the rule to reserve it for the graver forms of the disease. A number of cases of medium gravity was not treated at all according to the method of late only, or after other medication had been employed without any result. The patients were not always treated from the day of their admission on, and not until grave symptoms appeared, did the attending physicians make up their minds to combat them with cold water. To conclude we have been guilty of yielding to the inclination, to make the method milder and more rational and to individualize, which always shows itself when the first experiments with the hydriatic method are made, which accounts for the application in many of the cases of combined methods (baths and medicines) and incomplete, defective and insufficient cold water procedures. Hence the annual mortality in this second period is very variable, at times very low, at times high relatively, as can be seen from the following table:

1873...	44 cases.....	11 deaths.....	25.00 per cent.
1874..	142 “ .....	22 “ .....	15.49 “
1875...44	“ .....	5 “ .....	11.36 “
1876...50	“ .....	14 “ .....	28.00 “
1877...43	“ .....	8 “ .....	18.60 “
1878...47	“ .....	8 “ .....	17.01 “



1879...	36 cases.....	6 deaths.....	16.66 per cent.
1880...	81 “ .....	6 “ .....	7.40 “
1881...	142 “ .....	24 “ .....	16.90 “

The first experiments of Glénard date from the year 1873, in which year the water treatment was adopted for the first time in Lyon in the Hopital de la Croix-Rousse. In this year the mortality was 25 per cent. The remark however must be made that the method was employed in the second half of the year only and only in the ward St. Pothin, the division of Faivre, whose assistant Glénard was at that time. The first experiments of Glénards were successful. Nevertheless the method was not accepted without contradiction and modifications, At the end of 1875 and particularly in 1876 a reaction occurred not only in Croix-Roussee but in all the hospitals of Lyon, against what was called *rigorisme*, and Brand's absolutism; these years therefore show a stand still in the decrease of mortality.

III. The third period extends from 1882 to 1885 inclusive. For the last year those cases only are reported, which had recovered at the time of the publication of this book.”

This period contains 260 cases with 19 deaths, making a mortality of 7.3 per cent.

The annual averages vary far less than in

the preceding period, they are all below 10 per cent.

1882.....	80 cases.....	4 deaths.....	5.00 per cent.
1883.....	46 “ .....	2 “ .....	4.34 “
1884.....	62 “ .....	6 “ .....	9.67 “
1885.....	72 “ .....	7 “ .....	9.72 “

The decrease in mortality in this period is considerable compared with the first: 26.2 per cent; it amounts to less than one-third of the same. Thus the mortality from typhoid fever has been reduced two-thirds.

Shall we call in a *Genius epidemicus* as has often been done, to explain this striking decrease? Never before the introduction of the cold water treatment has the mortality from typhoid fever been as low as in the Hospital de la Croix-Rousse. During the whole of the first period from 1866 to 1872 the lowest annual mortality has been 28.05 per cent. Are there any where hospital statistics in existence with 260 cases extending over a period of four years, certainly long enough to meet the objection as to the benign character of the type of the epidemic having brought about the results, — are there statistics in existence which under medical or expectative treatment show a mortality of 7.3 per cent?

Since 1882 the head physicians, who have

succeeded each other in the medical division of the Hopital de la Croix-Rousse have come back definitively to the pure method. Some use it in all the cases without exception, others exclude the mild ones. We do not wait for any indication in ordering a cold bath. When no contradictions exist, the typhoid fever patient is bathed as soon as possible after his admission or at the latest on the following morning. Whenever the fever is of any considerable intensity, the internes institute the method, without waiting for the visit of the head physician. We make all exertions possible to meet the two fundamental indications to bathe from the very beginning, and to bathe as many cases as possible. There is left but one *pium desiderium*, that all the typhoid fever cases might come under our care before the end of the first week. Although we know, that our colleagues in the quarters of de la Croix-Rousse send us their patients as soon as possible, it is not always possible to overcome at once the scruples of the patients and his friends, when the word "hospital" is mentioned. This delay is the cause of many failures. Thus the somewhat higher mortality of the years 1884 and 1885 is explained by the circumstance that cases of a grave character or presenting complications or being in an advanced stage of the disease were brought to us."

Placing the 3 periods of the statistics side by side we obtain the following:                      percent.

I. 1886—1872,	229 cases,	60 deaths,	26.20
II. 1873—1881,	626    “	104    “	16.90
III. 1882—1885,	260    “	19    “	7.30

These results are almost identical with those of Liebermeister, who obtained in his first period of his statistics a mortality of 27.0 per cent, in his second of 16.2 per cent and in his third of 8.8 per cent.

In the statistics of the German military hospitals we find these three periods. Before the introduction of the method they had a mortality of 25.80 per cent in the second period, from 1868 to 1874 15 per cent and after that as the Brand method made progress it sank to below 8.9 per cent for the whole German army. Is this not a glaring proof that the prognosis in typhoid fever does not depend on the character of the epidemic but upon the prevailing method of treatment?

This fact may be placed alongside of the marked diminution of mortality since the introduction of antisepsis in surgery. This important fact not only from a scientific but also from a humanitarian standpoint—it must be said—is passed over in silence in the latest public statistics.” Dr. Bouveret informs me by letter that they had treated in a hospital during the last two years 100 cases wit but three deaths.

Every general practitioner is particularly interested in children's diseases—children forming the bulk of his patients; it will therefore be of interest to follow the method amongst this class. The general verdict seems to be that perhaps on account of the less deep lesions in the alimentary canal in children, the prognosis in their case is better than in adults; thus Murchison gives the mortality as amounting to 11.14 per cent amongst males, and 13.86 amongst females between 5 and 14 years of age. But that the results are not always as favorable may be seen from the facts that *Bathez and Rilliet* report 111 cases with 29 deaths (27 per cent) and in Paris in 1854 amongst 260 cases, 68 deaths occurred (26.15 per cent) in children under 15 years (see Murchison) and *Cayla* (T. and B.) reports that amongst 81 children treated in a period of four years in the *Charité* at Lyon 28 (34.5 per cent) have died. Such facts would seem to point to the view, that perhaps typhoid fever is after all more dangerous to children than the prevailing opinion would admit. Inasmuch however, as pathological anatomy proves that the intestinal lesions are less profound, in their case, we might expect, inasmuch as death here must be largely due to the fever that we should see particularly good results from the method and such seems to be the case as shown by the following

TABLE

Showing the result of hydiatic treatment amongst children.

Reporter.	No. Cases.	No. Deaths.	Percentage.
Hagenbach.....	28	1	3.5
Cayla.....	63	4	6.3
Brand.....	106	0	0
Total.....	197	5	2.5

After giving reports from special places let us now look at the total results obtained under the use of the method. Before reviewing these, however, let us glance at figures showing the results under *medicinal* treatment.

TABLE VIII.

Showing death rate under medicinal treatment of 8296 cases of typhoid fever.

No.	Observer.	No. Cases.	No. Deaths.	Per-centage.
1	Liebermeister.....	1718	469	27.3
2	Griesinger.....	470	89	18.9
3	Juergensen.....	330	51	15.6
4	Wunderlich.....	1178	213	18.1
5	Mil. Hosp. Stettin 49-59.....	1591	405	25.6
6	Hamburg Hosp.....	504	96	19.0
7	London fever Hosp.....	2505	465	18.5
...	Total.....	8296	1788	21.7



TABLE IX.

Showing death rate under medicinal treatment of 24,997 cases.

No.	Place.	No. Cases.	No. Deaths.	Per-centage.
1	Leipzig Jakobs Hospital..	600	111	18.5
2	Bethanien (Berlin).....	301	55	18.0
3	Wiedener Krank. H. Wien .....	928	171	18.4
4	The same 1871.....	449	91	22.4
5	Allg. Krank. Haus Wien. ....	17651	3973	22.5
6	Dresdener Krank. H.....	1497		13.1
7	Chomel Paris .....	147	47	32.0
8	Torges Strassburg.....	190	44	23.1
9	Paris 1854.....	4611	1002	21.7
10	Molard Metz.....	120	31	26.3
...	Total.....	24997	5525	22.2

In 1877, Brand, in the second edition of his Monograph "*Die Wasserbehandlung der typhösen Fieber*," Tuebingen, 1877, Lauppische Buchhandlung, published the statistics of 8141 cases, which being also a large number, may be fitly used to compare with those just given. I will premise, however, that amongst the 69 observers perhaps two-thirds only carried out the treatment with some approach to Brand's method; the remaining one third did use water also, but only in combination with other drugs and, to state the matter in simple language, very sparingly and insufficiently, the results being 6.0 per cent mortality in the former category, and 13.5 per cent mortal-

ity when deviating less and 15.8 per cent when deviating more from the systematic method, with variations between 0. and 25 per cent. Great variations in the result always indicate an inadequate application of the method, and it can always be seen that the correct application will keep the mortality down to a uniformly low level, be the character of the epidemic what it may.

TABLE X.

Giving an epitome of the large statistics of Brand of 1877, the death rate of 8141 cases, under hydriatic treatment.

Source.	No. Cases.	No. Deaths.	Percentage.
Private practice .....	689	14	2.0
Children pract. ....	197	5	2.5
Civil Hospitals. ....	4733	318	6.7
Military Hosp.. ....	1214	114	9.4
War Hospitals.. ....	1308	149	11.4
Total.....	8141	600	7.4

Table VIII. containing about the same number of cases will therefore fitly be compared:

	Per cent.
Medicinal treatment yields a mortality of	21.7
Hydriatic “ “ “	7.4

The water treatment thus diminishing the mortality two-thirds.

In 1887, Brand published some articles entitled “*Ueber den heutigen Stand der Wasser-*

*behandlung des Typhus*," in which he makes some additions to the figures above given, which may be seen by the following table.

TABLE XI.

Showing the gross results of the hydryatic treatment up to 1887.

	No. Cases.	No. Deaths.	Percentage.
1. Up to 1877.....	8141	600	7.4
2. Military Hospitals...			
1877.....	2081	206	9.8
1878.....	2112	190	8.9
1879.....	1741	163	9.4
1880.....	2534	226	8.9
3. Mil. Hosp. II. Armee Corps.....			
1882—83.....	477	17	3.5
1883—84.....	429	28	6.5
1884—85.....	392	14	3.5
1885—86.....	188	6	3.1
4. Juergensen(Tuebingen).....	220	4	1.8
Vogl (Muenchen)...	221	6	2.7
Tripier and Bouveret	481	29	6.0
Total.....	19017	1489	7.8

"Amongst these 19,017 cases," Brand adds, "there are all forms of typhoid fever, all primary and secondary complications, all ages, both sexes, epidemic and sporadic, benign and malignant cases, hospital and private practice, civil and military practice, peace and war, everything is represented, that might influence the course of typhoid fever. We have here an exhaustive and

complete synopsis, and if (what might have easily been the case) all observers had strictly adhered to my rules and carried out the systematic treatment, as Vogl, Tripier and Bouveret have done, these statistics and their result would be unavailable. But under the circumstances this is not the case. Some have followed Liebermeister's old or new method, some Ziemssen, others again Juergensen and myself, the most have followed a method of their own. All these methods have in common the application of baths, and so far they may be classified under the hydriatic method. But inasmuch as only in the cases treated after the Brand method all the requirements of the systematic water treatments are satisfied, in the rest, however, only those of the antipyresis, (i. e. that in the former all parts of the fever-process are combated, in the latter, however, merely the rise of temperature) it follows that the above statistics do not give results of either one or the other method of treatment, but of both together, i. e. a *mixtum compositum*, and that as a general result merely, it can be said, that where water is employed in the treatment of typhoid fever the mortality will generally be lower, than where it is not employed. Taking large figures the hydriatic treatment attains about one-half or one-third the percentage of mortality that the expectative method does,

the former about 8 per cent, the latter 15—20 per cent.”

Brand, selecting the observers that have followed his method systematically, finds that out of the 19017 cases, 5573 cases have been treated with 234 deaths = mortality of 3.9 per cent.

We now come to the sixth question: *What results have been obtained by the method when its execution is perfect?*

“From statistics,” Brand says, “which are available for such purposes, we have to demand:”

(1) That the number of the cases observed be as large as possible, many hundreds.

(2) Their collection must cover many years.

(3) All ages, sexes, stations of life, all constitutions, temperaments must be liberally represented.

(4) All possible primary complications must have occurred.

(5) The cases must have come under treatment early or at the right time, and the treatment must have been carried out systematically.

“As a matter of course not many such cases can be gathered.”

“Reports from civil hospitals cannot be used, because patients come there in a late period of the disease and are dismissed too early to exclude the development of secondary troubles, nor from

clinics which get their material from such hospitals for the same reasons.

The most useful material can be furnished by family practice in cities, where the physician's duty is not only to treat any sickness which may have occurred, but where the cure and development of the *body* of his patients are the object of the physician's attention. Here he knows every member of a family, hears of the very beginning of any sickness, is able to observe and treat the case accurately and to keep the patient under observation after recovery.

Reports from policlinical practice and general practice can be utilized to a small degree only. Those obtained in country practice (Brand has however, German conditions in mind) not at all. An exception to this rule can be found in Jürgensens policlinic in Tuebingen.

With the highest interest I have convinced myself on the spot, how this ingenious scholar and physician has understood to create for himself, in the village of Lustnau near Tuebingen, a policlinical territory, and I have observed the high respect and esteem which is shown him by the inhabitants. Everybody knows him, and likewise he knows everybody. He can justly be called the "family physician of Lustnau". The result of his activity therefore meets the highest requirements and demands.



Of the highest value are some of the reports from military hospitals. Soldiers generally come under observation in an early period of the disease, and remain under observation for the detection of any *sequelae*. The mortality amongst them is a high one, hardly less than that of persons more advanced in years. They are therefore valuable subjects for testing the specific treatment of typhoid fever.

To ascertain correctly, therefore, the true rate of mortality of the systematic water treatment, there are only suitable out of a great number of reports, the following :

Juergensen, Tuebingen,	217 cases,	1 death.
Vogl, (Muenchen)	221	“ 6 deaths.
Milit. Hosp. Stralsund, 1877-82,	257	“ 1 death.
“ Stettin, 1877-82,	186	“ 3 deaths.
Brand (family practice) haus-ärztliche Praxis,	342	“ 1 death.
Total 1223 cases, 12 deaths and 1 per cent mortality.		

It must be added that three cases of Juergensen are omitted, these not having been treated with water.

Although amongst the Pomeranian military hospitals there are others with a minimum mortality from typhoid fever, only those of Stralsund and Stettin have been utilized, the former because the figures can be inspected in the

official sanitary report, the latter because the observations have been made, so to speak, under my eyes.”

“My own 342 cases have been collected in the course of 30 years in a city where a grave form of typhoid fever is prevalent, as can be seen from the statistics of the military hospital given above and from the history of cases which I have published. Taking into consideration the small number of cases, one may conclude that everything has been thrown out which was not genuine typhoid fever. One may be convinced that all primary complications as well as all shades and forms of the disease are represented in this number.

These 1223 cases then would seem sufficient evidence, and the true rate of mortality would therefore be 1 per cent.”

This rate of 1 per cent Brand even thinks too high, inasmuch as none of those 12 cases which ended fatally, received systematic treatment before the fifth day.

Having these figures before us, what answer shall we give to the question: Are we justified in using the cool bath treatment of typhoid fever? I, for my part, would answer, that I am not only justified, but I feel as though I did not do my duty to my patients *not* to propose this mode of treatment, and have done so for over a

year, in private practice, about which I shall add a few words at the end of the volume.

Of course the objection may be made, that the evidence here offered is of the *post hoc—ergo propter hoc* kind. Those who make this objection I should like to ask on what sort of evidence do they use quinine in malarial attacks, mercury and jodide of potass in siphylis, iron against chlorosis iodine against goitre—vaccinate against smallpox.

Have they an insight into the nature and working of the malarial poison on the one hand, and a knowledge of the molecular structure of quinine on the other hand, that they can offer scientific reasons for the employment of quinine? If there are any such reasons I have never heard of them. Yet what is considered as a more certain therapeutic proposition than that quinine will check intermittent malarial attacks. Nothing of course is more difficult than to judge of the value of any therapeutic measure. But in many cases we are satisfied with the *post hoc. viz.* when the exhibition of some remedy and improvement in the patient occurs so regularly, if not uniformly, under all possible conditions, and in the course of a number of years,—then our logic compels us to bring the two facts into connection.

In the present case we have the results not in the practice of *one* man, but of dozens of ob-

servers, we have not only the originator, who might be expected to be carried away by enthusiasm, but by able men, practitioners and teachers, who are able to judge ; we have not a series of recoveries out of a lucky year, when the disease was of a mild type, but the observation has now been carried on for 30 years; the results of this treatment do not vary with the gravity of the epidemic, but with the thoroughness of the therapeutics; the mortality rate wherever the method was introduced, was at first high, as the method was not carried out systematically, but steadily sank to a uniformly low level, together with the improvement of the treatment; we find the same result not only in north Germany but also in the south, not only in Germany but also in France.

But we have other evidence to offer for the value of the method in studying the effect on the symptom of the disease and the function of the body, which will be done in the next chapter.

Here it might be in place to discuss a topic, which in practice we will be able to meet, especially when we wish to introduce the method in a community where it is unknown. When we shall suggest the method, the patient, if he is conscious, or his friends, will be very apt to object, and will ask whether the method is not a very dangerous one. Happily we can tell them

that there is no danger at all. I can say that I have had about 1500 baths given to patients from 19 months of age up to 40 years, and amongst those no incident occurred which gave any alarm; but my experience is small. Let us ask others. Vogl says: (Deutsch. Medc. Wochenschrift 1888. 48. 49). "The objection to the cold bath on account of the danger connected with it has been silenced, after the thousands and thousands of baths that have been given in Germany and France, have with but very rare exception been followed by no accidents, and in the Münchener Medic. Wochenschrift No. II. 1889 we read :

"We could ascertain after an experience of thousands of baths that a cold bath of 15° or 14° R—even 12 R (66 to 60 F) was absolutely without danger to a feverish patient of a normal constitution, and that it may be used when high fever is present, even if the diagnosis of typhoid cannot as yet be made, and we can *affirm* that the contra, indications, which to us as well as to other beginners misinterpreting certain effects of the bath as heartweakness, were great hindrances, can be reduced to a minimum."

Of course the small, hardly perceptible pulse, the shivering, the cold hands and feet — symptoms lasting perhaps 15—20 minutes after the patient has come out of his bath, will make the physician, who makes his first trial, feel a



little uneasy and may alarm the attendants, but soon both physicians, friends and nurses will see that these conditions are not ominous, and will feel perfectly quiet.

While we can confidently allay all fears as to the danger, we cannot say that the procedure will be a pleasant one to the patient in many cases, and of course there is some trouble connected with the application of a number of baths, perhaps 8—12 a day in severe cases. But I think the patient will be doubly repaid for the unpleasant sensation he may have on entering the bath and during the last part, and the shivering afterward, by  $2\frac{1}{2}$  hours and more of sweet sleep, and the avoidance of many other unpleasant symptoms. It will not be without interest to hear what Dr. Vogl has to say on this point as one, who, on account of an attack of typhoid went through the experience himself, and who took 92 baths during two weeks, in the first days of 14 R and in the last of 16° of 15 minutes duration, when the temperature was 39 C. in the rectum. He says: "To speak about the sensations which the bathing produced in my case, I will admit freely, that the stepping into a bath, always without aid, with a body temperature of 104, on account of the contrast, will produce the feeling of shock, which is difficult to describe and by no means pleasant. But this lasts but a short time,



the cooling-off-process, which follows it, acts very pleasantly. It is not difficult to endure the prescribed 15 minutes. Near the end of the time the longing for subjective warmth makes itself felt, and an extension beyond this time makes itself felt more unpleasantly than the shock upon entering the bath, if excessive also as more dangerous than an excessive shock. After the rapid but thorough drying there follows in the warming of the surface of the body and together with that an unestimable feeling of satisfaction (*Wohlbehagen*) and relief during an external and internal normal temperature. There follows a longing for food and sleep, and during night a refreshing sleep which lasts the longer, the slower the temperature rises.

In the first days of the fever-acme the subjective unpleasant sensations make themselves felt during the last one-quarter or one-half of the two or three hours interval (but not any sooner) due to the fever then getting the upper hand, such as general discomfort, restlessness, and heat on one-half of the face and on the body, cessation of sleep, frequent respirations etc.

These symptoms increase rapidly and approach the condition of a deeply disturbed brain function, one feels himself near the confines of consciousness; soon the first indications of de-

lirium and hallucinations show themselves ..... the taking of the temperature shows the high fever and furnishes the indication for a bath, which one submits to with more willingness, inasmuch as one cannot be in doubt concerning the further increase of the symptoms without a bath. Nor does one hesitate to bathe even when the 39 degrees have not been reached in order to feel well for  $1\frac{1}{2}$  to  $2\frac{1}{2}$  hours. Under such observations the fever took its course without complications as I am accustomed to see it with my patients.

With such a strict execution of the bath-treatment there was a chance to compare the sensations that are produced on the one hand by the cool bath itself and its effects, and on the other hand by the increasing fever-heat and its attending phenomena. I can corroborate, what the observation of numbers of cases of typhoid fever before or after the introduction of the baths — has shown to me, that the patient who does not bathe suffers a good deal more than he who does, as long as his abnormal sensations affect his consciousness at all.”

#### RESUME.

The hydriatic treatment has reduced the mortality from typhoid fever :

(1) In Munich from 20 per cent to 6 per cent.

(2) In Stettin and II. German Army-corps from 26 per cent to 5 per cent.

(3) In the Prussian army at large from 25 per cent to 9 per cent.

(4) In some of the French hospitals from 26 per cent to 8 per cent.

(5) In the practice amongst children from 11 per cent to 3 per cent.

(6) Taking the largest numbers in consideration the mortality under ordinary treatment has been 22 per cent, while under water treatment it has been 8 per cent.

(7) Where the method was carried out the most systematically, the mortality has been reduced to 1 per cent.

(8) The hydriatic method is not a dangerous procedure.

(9) The hydriatic method is useful in combating annoying symptoms, and is only unpleasant for the patient when he has to step into the bath and during the last stage of the process.

## CHAPTER II.

The influence of the hydiatic treatment on the different organs, functions, and symptoms.

In this second chapter the influence of the baths on the temperature, on the organs of circulation, on the organs of respiration, and digestion, on the skin and the urinary secretion, on the nervous system and the general condition of the patient will be described.

In this important chapter which is to demonstrate that the cool bath treatment is not simply, like antifebrin or the allied remedies, an antipyretic remedy, but is able to influence the system in a marked and beneficial way otherwise, besides cooling off the patient momentarily, Tripier and Bouveret as well as Vogl will be given room to report on their experience. Any minor differences might be explained by the circumstance that Vogl's patients were soldiers who almost always came under observation soon after they were taken ill, while the observations of Tripier and Bouveret were made on persons of all ages and both sexes, who came under treatment in various stages of the disease. I think the uniform results of the observation of different observers

speaks strongly in favor of the useful and reliable qualities of the method.

Whether high temperatures are very dangerous to the organism or not, at any rate high temperatures and a dangerous condition of the typhoid-fever-patient are apt to go hand in hand, and it is not unreasonable to assume that the temperature indicates not only the condition of the heat regulating apparatus, but reflects also the condition of other nerve-centers and organs, the action of which is of the highest importance to the organism. The influence on the temperature, which the water treatment exerts, will thus always be an interesting and important study.

#### INFLUENCE OF THE BATHS ON THE TEMPERATURE.

*The temperature during the bath.* T. and B. have made observations (by means of a thermometer, which could be wholly introduced into the rectum) on this question, and have found that as a rule a rise of temperature during the bath could be observed, that this rise might amount to 0.1—0.8° C., that it was apt to be higher at the beginning of the bath than at a later period, that it was more marked in cases, that were in the first stage of the disease, and in graver cases which in other ways showed a great power of resisting the cooling-

down-process. A marked rise of temperature during the bath thus would be of some prognostic value, indicating that the case was not of a mild type.

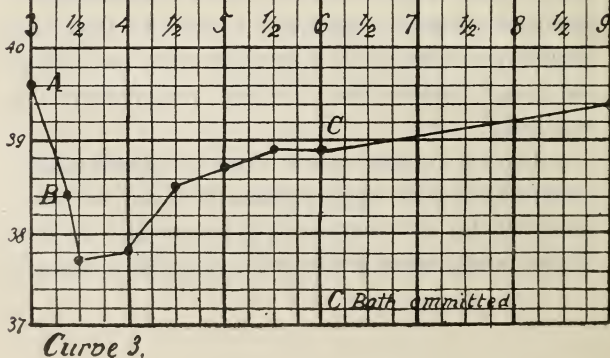
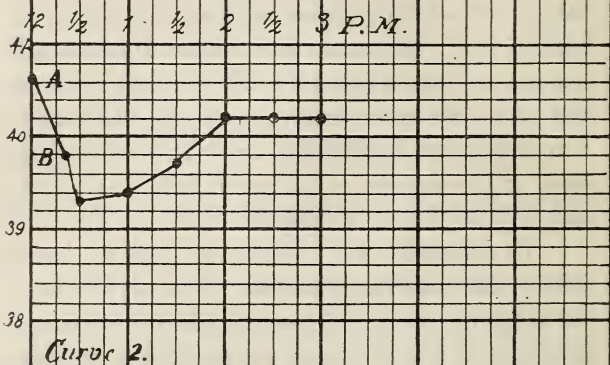
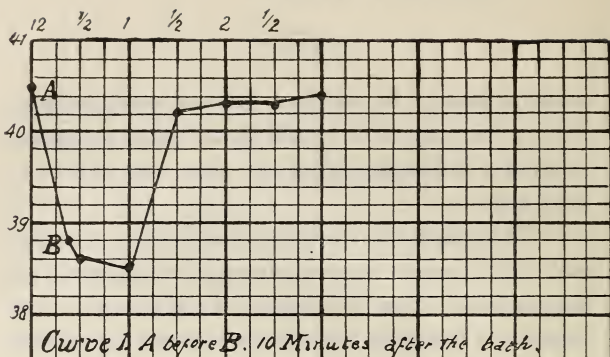
*The temperature between the baths.* “In the majority of cases there is observed a reduction of temperature after the bath, of a greater or less degree. Generally the maximum of this reduction does not take place immediately after the bath. When the patient is dried off and put back to bed, the temperature sinks further and reaches its lowest point 15, 20, 25, 30 minutes and even one hour later, remaining stationary here often but a short time, and then ascending more or less rapidly to the point before the bath and even higher.” T. and B.

To illustrate this matter T. and B. have drawn three curves (See Plate I). In the first the temperature has almost reached its former height in  $1\frac{1}{2}$  hours, in the second it has in two hours come within  $0.4^{\circ}$  C. of the former temperature without a tendency to rise further, in the third the ascent is a gradual one, requiring six hours before the former temperature is reached.

Curve I. was taken from a grave case: atactic form with hyperpyrexia, 9th day of sickness, 1st day of treatment; it shows the course of the temperature measured every 30 minutes,



# PLATE I 3 P.M.



between the first two cold baths from 12—3 P. M.

Curve II. is taken from the same case but from a much later period.

Curve III. is taken from a case of medium gravity admitted on the 22d day, the fever is already under control; for 4—5 days the patient is omitting baths, that is, his temperature does not reach  $39.0^{\circ}$  when taken every three hours.”

The following table of Ziemssen (Brand) shows the effect on the temperature under various conditions:

Degree of Reduction.	Children.	Grown Persons.	
		Mild Cases.	Severe Cases.
0.2.....	0 times.....	0 times.....	6 times.....
0.3—0.5.....	1.....	17.....	116.....
0.6—1.0.....	6.....	120.....	434.....
1.1—1.5.....	8.....	270.....	837.....
1.6—2.0.....	6.....	82.....	270.....
2.1—2.5.....	3.....	13.....	54.....
2.6—3.0.....	8.....	1.....	12.....
3.1—3.5.....	11.....	0.....	6.....
3.6—4.0.....	12.....	0.....	0.....
4.1—4.5.....	5.....	0.....	9.....
4.6—5.0.....	6.....	0.....	0.....

The following results have been obtained by these and similar observations :

1. “The absolute effect of the bath is greater in the case of children, than in the case of grown persons, less in grave cases of grown persons,

and when the fever was of a subcontinuous type.

2. The duration of the effect of the bath is more considerable in mild cases of grown persons, less with children and least in grave cases with high continuous fever.

3. As the disease advances, the absolute effect as well as its duration is, as a rule, more pronounced, the subcontinuous fever only being the cause of exceptions." (Brand):

The average effect of the bath is in grown persons  $1.3\text{--}1.5^{\circ}\text{C}$ . (about  $2\text{--}3^{\circ}\text{F}$ .) in children  $2.0\text{--}2.5^{\circ}\text{C}$ . (about  $4\text{--}5^{\circ}\text{F}$ .).

The duration and the temperature of the bath are of importance on the reduction of the temperature. In the beginning of the bath the body defends its temperature against the cooling process, but after a while the bath gets the upper hand. A chill at last sets in and at the same time the body-temperature begins to sink. This chill may occur in 5—6 minutes in mild cases, and in very severe cases without heart-weakness in 15 minutes, as a rule in about 12 minutes. The baths generally employed having a temperature of  $20^{\circ}\text{C}$ . ( $68^{\circ}\text{F}$ .) will generally produce the desired reduction of  $1^{\circ}\text{C}$ . (about  $2^{\circ}\text{F}$ .) but in some cases these results are not reached and water of lower temperature  $18\text{--}15^{\circ}\text{C}$ . ( $59\text{--}65^{\circ}\text{F}$ . about) has to be employed. Similarly a pro-

longation of the bath which generally is to last 15 minutes, will produce a reduction which the usual bath of 15 minutes will not produce.

Although mentioned above already it is important to state specifically, that in a later stage of the disease the resistance of the fever to its reduction is not as strong as at an early stage and a considerable fall of temperature in this stage does not always indicate that the case is a mild one ; if a favorable change in other symptoms does not take place at the same time it may show that the heart is beginning to fail and that a modification of the ordinary formula is indicated.

The observations of the effect of the first baths is not without value as well as regards *prognosis* as treatment. If the reduction of the temperature is but small, and the same has risen in a short time ( $1\frac{1}{2}$ —2 hours) to its former height, the chance is that we have a graver form of the disease to treat; if the reduction is sufficient, and particularly if the temperature is slow to go back to its former height, the chance is that we have a mild form, the latter to be an absolutely favorable sign, must of course be accompanied by favorable changes in the pulse, nervous symptoms etc. Nor have liberal reductions in a late stage the same happy significance as when occurring in an early stage.

For *method of treatment*, likewise, the observations on the effect of the first baths are of importance. If the ordinary formula, a bath of 20° C. temperature and of 15 minutes duration should show itself insufficient after a trial of a day or two, then the treatment has to be carried out with more vigor. Vogl and Tripier and Bouveret increase the number of baths, reducing their temperature, while Brand prolongs his baths, also reducing their temperature under such circumstances.

Further as will be pointed out, children require shorter baths, and in persons of feeble heart in advanced stage of the disease the ordinary formula is to be modified ; either a *short* cold bath is to be employed, or cold effusions in the luke-warm half-bath. (After T. and B.)

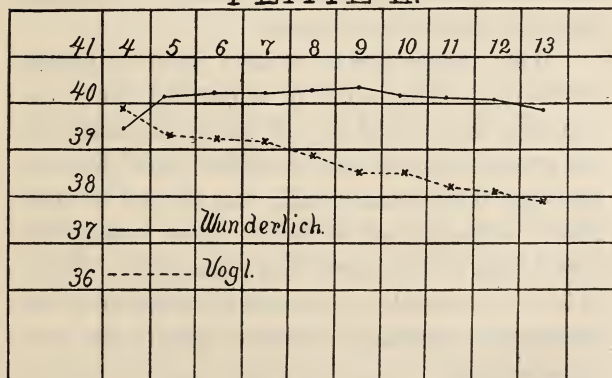
*Modification of the thermometric curve.* Although every case has its own peculiarity, yet on the whole the type of enteric fever is to rise gradually for 3—4 days, to remain at an even height in the neighborhood of 40° C. (acme) and at the end of the third or fourth week to descend, the morning temperatures descending lower than those of the evening. Has the cold water treatment any effect to change this typical course, or are the baths (as so many doses of antipyrine) only able to cool off the body as often as they are given? I place alongside the average daily tem-

perature of a case of *Wunderlich* which I find in *Murchison* from the fourth to the thirteenth day, and those of a case treated hydriatically by *Vogl* which I find in an essay of *Brand*.

	Celsius.		Fahrenheit.	
	Wunderlich	Vogl.	Wunderlich	Vogl.
4th day..	39.5	39.9	103.1	103.8
5.....	40.1	39.4	104.2	103.0
6.....	40.3	39.3	104.6	102.8
7.....	40.3	39.2	104.6	102.6
8.....	40.4	38.9	104.8	102.0
9.....	40.5	38.6	104.9	101.5
10.....	40.3	38.6	104.5	101.5
11.....	40.1	38.2	104.2	100.8
12.....	40.1	38.1	104.2	100.6
13.....	39.9	37.9	103.8	100.

Plate II. illustrates the same fact graphic-ally.

## PLATE II.





Vogl says on the effect of the baths on the fever-curve the following : “The highest temperature is furnished by the evening of the day on which the patient is admitted to the hospital or perhaps on the day following ; during the next days already it will be lowered and with it the average temperature—provided that the baths do their duty, and that is the rule. It is a matter of indifference whether we have had on the first day a continuous fever with a rapid ascent after each bath, or if from the start the resistance against the baths was less vigorous on the second or third day by the continuous interruption of the ascent, this tendency is overcome, and thus the average temperature is lowered beneath that of the first day. Thus a reduction of some tenths of a degree from day to day is brought about through the whole period of the acme, whether this should last one, two or three weeks.

This course may be looked upon as typical of the water treatment, it is reached the more certainly and completely if the baths have the chance to exert their influence from the very first day of the akme, but it can also be brought about, although not in such a pure form, after several days of the acme have passed by. Even if it is not possible to produce a reduction of the average temperature, a further rising of the same is prevented.

If the acme is of two weeks duration the average temperature of the first week will be  $39^{\circ}$  and over, with evening exacerbations of  $40^{\circ}$  and over, of the second week  $38^{\circ}$  and over with exacerbations of  $39^{\circ}$  and over, to decline in the third week.

It can thus be said that the cold baths will (without masking the day- and night-periods, and without interfering with the appearance of the normal maxima) force down the exacerbations by numerous small remissions, and by their unremitting action gradually and certainly force the average values to a lower level. This is the rule which has the fewer exceptions the earlier the case comes under treatment."

It may be worth while to remind the reader, while he is comparing the figures from Wunderlich's and Vogl's case, that whereas in the cases treated with medicines or expectatively, the figures given show the temperatures to which the patient was actually exposed, the figures from the case treated hydropathically have not the same significance, here 8—12 remissions occurred, not appearing in the curve lasting each 1—2 hours, during which the patient was at a low, almost normal temperature.

Vogl points out the important clinical fact that the water treatment does permit an insight

into the nature of the case, whether it be one of grave or mild character.

The favorable results of the water treatment have been met by the objection that all these cases were of a mild form, and would have recovered anyhow. The resistance which the fever offers to its reduction will demonstrate the gravity or mildness of the case, and thus allow to judge of the value of the treatment.

The results obtained by T. and B. on the effect of the baths on the fever-curve agree very well with those obtained by Vogl. Their conclusions are based on 84 curves obtained in the following way. The temperature was taken before each bath, generally eight times a day; of these the average was taken, indicating the status of the fever for that day. Plate III. is an illustration of such a curve. The upper giving two of the eight absolute measurements, the lower the average temperature for the day. It must, however, not be forgotten, that the patient was actually at a lower temperature two-thirds of the time, the notation not indicating the remissions brought about by the bath.

“The examination of these 84 curves.” T. and B. say, “leads to the following propositions :

(1) *The average temperature of the first day is a maximum which all the future daily averages will not exceed, no matter in which period of the*

*disease the treatment may have begun, or in other words : this average of the first day is the highest point of the averages of the maximum temperature.*

A rare exception to this rule may occur if a grave case comes under treatment very early, while the temperature is yet rising from day to day ; here the upward tendency of the fever cannot be suppressed.—Cases of a grave character, however, are not rare in which treatment was begun on the fourth day, hence before the acme had been reached, where the average of the maxima of that day were the highest of the curve.

(2) *From this maximum of the first day the curve descends to a point near the temperature of 39.0°, and then bends down slower or faster, according to the nature of the case to stop at the normal temperature of 37.5°. These remarkable results are obtained by the cold bath treatment only, and no other medication can bring them about.*

These two propositions will hold good for the great majority of cases, but only if the treatment is carried out strictly after *Brand*."

*T. & B.* following *Brand* divide the disease under hydropathic treatment into three periods : The period of the combat with the fever, the

period of relative pyrexia, and the period of defervescence.

They divide the cases into three groups : In the *mild cases* there is no combat with the fever. After a day's treatment the fever begins to abate, and is lowered from day to day, so that in the mild forms we can speak only of a period of defervescence, which begins with the first day of treatment. Nor is the period of the disease, in which the patients come under treatment, of any consequence, the fall of the temperature beginning at once whether the patient is bathed on on the fourth or fourteenth day. It seems that in the mild forms the pathological process offers but little resistance to the cooling process, and a moderate refrigeration of short duration will produce a permanent lowering of the temperature. The steep curves which are found in cases treated expectatively or with medicine, during the last stage of the disease, due to high evening temperatures associated with low or normal morning temperatures, disappear altogether, the baths successfully interfering with the rise in the latter part of the day.

T. and B. are inclined to the view, that the water treatment does actually shorten cases of this mild form, because the action of the water is always of the same prompt effect. in all stages of the disease.

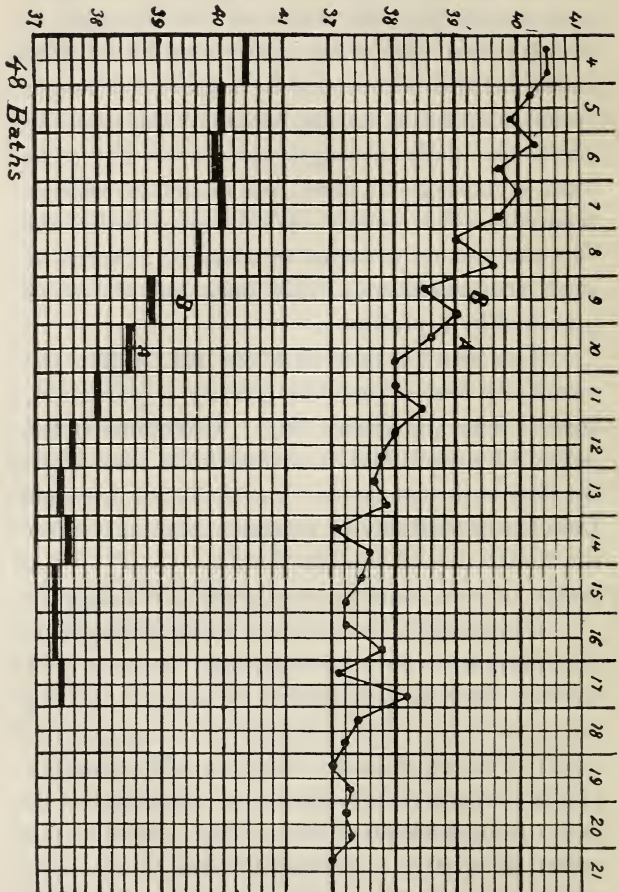
“In cases of *medium gravity* the fever resists the process of cooling far more. This can be seen at once from the curve of the averages of the maxima. Defervescence exists as in mild cases, but this is preceded by a shorter or longer period, depending on the nature of the case, in which the daily averages remain on the same level or undergo at least but moderate vacillations about that point. While graphically the curve of the mild forms consists of a series of steps (defervescence), this form has the steps preceded by a platform.

This can be seen on Plate 'III. where the curve of a case of medium gravity is presented, treated from the fourth day. Undoubtedly the period of ascent had not come to a close when the first bath was given. Yet the curve descends from the second day of treatment and only after the fourth day of combat the first “step” of the period of defervescence can be seen.” T. and B.

*Grave cases.* The resistance against the cooling process is here still greater; hence a new curve. Between the period of combat and the period of defervescence there is a new period peculiar to grave cases in which the daily averages of the maxima remain almost at the same level, in the neighborhood of 39°. This period is the period of relative apyrexia of Brand. Inasmuch as the curve of the averages of the maxima re-



PLATE III



mains in the neighborhood of  $39^{\circ}$ , the fever of course continues, but the fever moderated by the cold water ceases to be dangerous. The eight daily remissions lasting 1—2 hours must not be forgotten, inspecting such a curve as is seen on Plate III. Hence when after a more or less prolonged combat with the fever the curve approaches  $39^{\circ}$ , and with this period of relative apyrexia an improvement in the general condition be and an amelioration of the grave symptoms can be observed.

The following table shows the duration of the different periods in 18 grave cases.

Beginning of Treatment.	Duration of Combat with fever.	Duration of relative apyrexia.	Duration of Defer- vescence.	Total Duration.
4th day....	4 days.....	21 days....	6 days.....	34 days...
4.....	4.....	7.....	8.....	22.....
5.....	5.....	19.....	6.....	32.....
7.....	8.....	6.....	6.....	26.....
7.....	2.....	13.....	6.....	28.....
7.....	6.....	5.....	9.....	26.....
8.....	7.....	14.....	9.....	37.....
9.....	7.....	5.....	10.....	31.....
9.....	3.....	22.....	6.....	39.....
9.....	7.....	9.....	7.....	32.....
10.....	3.....	13.....	7.....	32.....
11.....	5.....	7.....	3.....	25.....
13.....	5.....	8.....	?	?
14.....	6.....	7.....	6.....	31.....
14.....	5.....	15.....	7.....	40.....
17.....	1.....	18.....	7.....	42.....
16.....	7.....	9.....	7.....	38.....
22.....	8.....	5.....	7.....	40.....

The number of baths necessary to effectually combat such cases is at times considerable; 80, 90, 100—120 baths have thus not rarely been used.” T. and B.

Comparing the results of Vogl with those of Tripier and Bouveret, we see that in the essential points they agree, which is that the baths will not only cool off the patient for the time being, but that they further have the power to change the typical curve of the fever by preventing, after a shorter or a longer time, the temperature from rising to its former height and enabling the organism, more and more from day to day, to bring its temperature down to the normal condition, the patient thus passing through the phases of the disease at a lower temperature due partly to the repeated cooling of the body, partly by enabling the heat-regulating apparatus of the body to carry on its function nearer to the normal way, and thus preventing the production or accumulation of abnormal heat-quantities.

Compare also the table at the end of the volume, presenting the curves of two cases by Brand.

#### THE INFLUENCE OF THE COOL BATHS ON THE CIRCULATORY ORGANS.

Vogl has found the following results: “The increase of the pulse-rate, which generally is 100, when the patient is admitted, is cut down, and

that even more promptly than the temperature. As in the single bath, the pulse is influenced before the temperature, so the constant reaction of the baths during the first days of the fever shows itself more promptly and more energetically in the innervation of the heart than in the regulation of the heat-regulating-organs. The evening pulse goes down generally, even on the second day to 96—92, even to 84 and remains at this level throughout the acme, even if the evening temperature of the first week remains between 40 and 41°, and that of the second week between 39 and 40°. This condition can be observed in so many of our cases, that it may be looked upon as the rule—exceptions however are not excluded. It was rarer for the pulse to exceed 108 during the entire acme of the fever, than to remain normal—excluding the day of admission—even if accompanied by relatively high temperatures. This decrease of the pulse rate was *constant* in the cases with an acme of one week's duration, even if high temperatures were present, and of *almost* regular occurrence in the cases, where the acme lasts 2—3 weeks.

An insufficient influence of the baths on the frequency of the pulse indicating a more or less dangerous condition of the patient, the pulse rate has, through the baths, gained in importance as a prognostic sign; at the same time it furnishes a

most urgent indication for increasing the amount of stimulants in a liberal way—as much as the patient will bear—but not to discontinue the use of the baths. Acting according to this principle one has at times the satisfaction to see results which seem to contraindicate the rules of prognosis based on the pulse. In two of our cases, which had come under treatment too late, the pulse remained between 128 and 132 for a number of days, and in one case the pulse varied between 120 and 148 for three weeks with evening exacerbations of  $40^{\circ}$  but considerable morning-remissions. All three cases recovered. In these very cases, which so frequently are looked upon as contraindicating the use of the baths, it becomes apparent how the heart is induced by the cold baths to do fresh work, and enabled to perform it, not, however, without liberal allowances of alcohol.

That the marked and permanent decrease in the frequency of the pulse is after a number of baths accompanied by a favorable change in the quality of the pulse, is what might be expected. It may be asserted, that the dirotism of the pulse under the methodical administration of the baths has become as rare as it was frequent formerly. It was observed in the neglected cases mentioned above either at their admission or later on, when the heart began to grow



weaker. It is not rare, that when well marked at the time of admission, the acme having probably been in progress for 3—4 days, the dicrotism is again suppressed even if the frequency of the pulse is not decreased, the latter in general apparently not corresponding with the dicrotism.

Nobody disputes or refutes these statements concerning the stimulating properties of the cold water on the innervation of the heart, but in practice there is the inclination to fear the opposite. The theoretical fear of collapse as an effect of cold on an intact, and even more on an already insufficient heart-action, is too often an impediment for the first trial or the continuation of the cold-bath-treatment. And yet in the first days the weakness of the heart which, as indicated by a weak apex-impulse, feeble heart-sounds and arhythmic beat, while of rare occurrence, is the most urging indication for the administration of the cold baths, and the most certain and reliable measure against anything like collapse.

The condition however, of the patient in and after the bath which so frequently is the occasion for the discontinuance of the procedure is not collapse at all. In this matter experience must be allowed to have a voice: we have in the course of 15 years during which thousands of baths have been given not only in enteric fever, but also



in pneumonia, scarlet fever etc., not observed in a single instance a condition which could be called collapse either in connection with high or low temperatures. It may be admitted, that a prolonged coolness of the body surface, accompanied by chilliness, goose-skin, shattering of teeth and a blueish color of the face, together with a scarcely palpable, contracted pulse are undesirable phenomena for the physician as well as for the patient. They signify that something has been omitted in the procedure tending to keep up the peripheral circulation : energetic friction, rapid warming and the administration of stimulants. A more minute attention to these points will prevent the recurrence of this condition.

Ziemssen expresses himself in the same way when arguing that not a slight chill, but a decided shivering, a rigor is to be the sign determining the end of the bath, that one is inclined to be too timid with reference to the complaints of the patient and the objective signs of the vigorous contraction of the blood-vessels of the skin; that in the course of time one grows more callous in the matter and does not pay so much attention to the pulse which after the bath is apt to be small and difficult to feel.

Experience then, favors that view, which does not see in a frequent pulse, especially in the

first days of the acme, a contraindication for the bath, but on the other hand, rather an indication, excluding of course conditions which will not escape the watchful eye of the physician. The closer these principles are adhered to, the more conspicuous will be the favorable influence of the baths on the heart and at the same time their harmlessness will become apparent.”

*Tripier and Bouveret* have the following to say on the effect of the baths on the circulatory organs: “The cold water, the cool bath, is a true tonic for the heart. The cold bath prevents the acceleration of the pulse and makes it stronger, it diminishes or removes the first sign of heart-weakness. This takes place however, thoroughly only if the treatment is begun early and carried out methodically. If begun at a later date this relation is less favorable, and threatening heart-failure in a very advanced stage of the disease will require a modification of the ordinary formula.

Some minutes after the patient is placed in the cool bath the pulse increases in number, the artery is more tense and with difficulty to be felt at the wrist. This initial acceleration is more frequent with women than with men, and particularly pronounced in nervous women. Towards the end of the bath the frequency of the pulse is diminished, it may be less than before

the bath. When the patient, shivering from cold, is brought back to bed, the diminution of the pulse is still more marked, and 10—30 minutes later 4, 6, 10 beats less are counted than before the bath. This minimum almost coincides with the greatest reduction of the temperature; but the higher the temperature rises after the bath, and the more that the beneficial effects of the bath pass away, the more does the pulse increase, and at the same time the redness of the face, the dryness of the mouth, the headache, and, in short, all the symptoms return which furnish the conditions for the repetition of the bath.—The influence of the cold bath on the pulse is, as might be expected, different under different circumstances. In the cases of a grave character from the beginning, accompanied by severe nervous symptoms and rapid pulse, the first baths often produce but a very moderate diminution of the frequency of the pulse. After 3—5 days of the treatment the influence of the baths is greater, and one-half, one hour and more after each bath, the pulse is diminished 8—10 beats. In mild cases and those of medium gravity this favorable result is obtained earlier, often after the first baths. Generally the pulse rate remains low in a case of enteric fever treated systematically and from the beginning. Even in grave cases not over 110—120 beats

are counted. One cannot see here, as in cases treated with medicines, that the pulse rises higher and higher up to 130, 140, and 150 beats, indicating by its frequency a weak condition of the heart. The pulse curve does not rise in the course of the fever, it remains stationary or sinks, keeping parallel to the temperature curve.

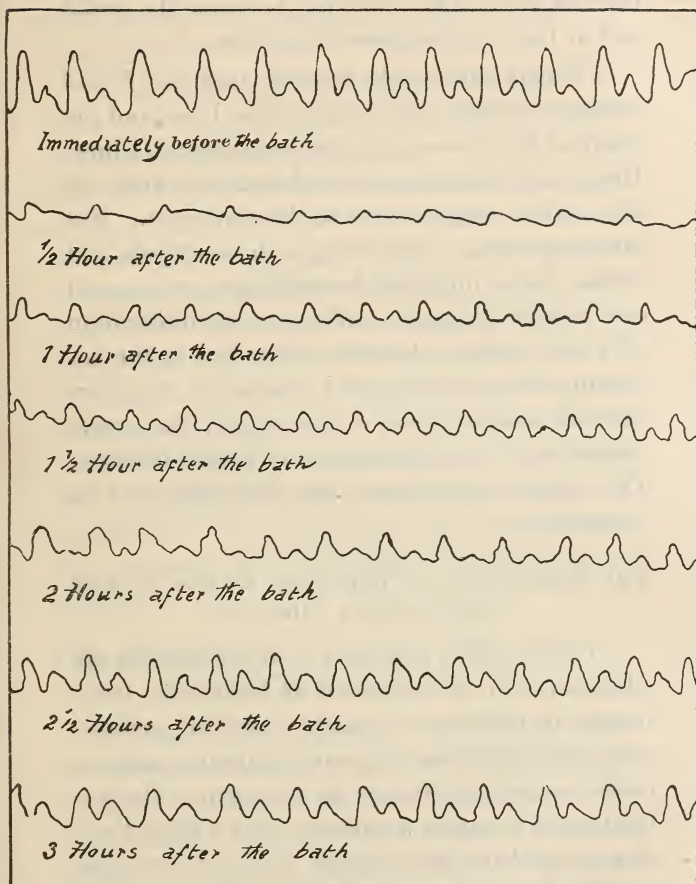
A dicrotic pulse is always a sign of a certain weakness of the heart and the blood-vessels. According to *Brand* dicrotism can be absent even in grave cases during the whole course of the sickness, as long as the treatment is begun early and carried out according to the rule. If dicrotism is present in the beginning of the disease, it disappears sooner or later under the new regime. The influence of the bath on the pulse, increasing its frequency and suppressing the dicrotism, is certain proof of the tonic effect of the bath not only on the heart but also on the peripheral blood-vessels. The high and continuous fever produces the paralytic relaxation of the muscular coat of the arteries, which according to *Marey* is the cause of dicrotism, which we see too frequently in typhoid fever. The effect of the cold bath on the nerves of the skin raises the tonus and produces even a vigorous contraction of the arteries, hence the complete disappearance of the dicrotism.

But, as on the temperature, so on the pulse

the influence of the bath is transient only, so that the pulse soon becomes more frequent and dicrotic again. The following seven sphygmographic curves show the gradual modification of the pulse between two baths. (See Plate IV.) The observations were made on a young man, a case of medium gravity, bathed from the tenth day on.

Before the bath the pulse is large, its dicrotism very marked, pointing by this peculiarity to a diminished tonus of the arteries. A half an hour afterwards the pulse is slower, not so high, and shows no trace of dicrotism; the tonus of the arterial wall has returned, the artery itself is so contracted, that it is difficult to obtain the tracings of the pulse curve. One hour after the bath the pulse has regained a certain volume, and the dicrotism begins to reappear. After this the tonic effect of the bath grows weaker and weaker, so that after three hours the pulse has regained its former peculiarity excepting as to the volume, which remains somewhat reduced. Placing these sphygmographic curves side by side one can see plainly the relaxation of the muscular coat of the artery. — Every bath produces the same modification: a prompt stimulation followed by diminution of the arterial tonus. But the oftener the baths are repeated, the more permanent will this increase of the arterial tonus be-

PLATE IV.





come, so that the dirotism will only appear in the last part of the interval between the baths and at last will disappear altogether.

It may thus justly be said, that the *Brand* method increases the energy of the heart and the tonus of the vessels and prevents heart failure. Hence also the favorable influence it exerts on the initial congestions and hemorrhages. Not rarely epistaxis, metro rhagia, haemoptysis and certain initial intestinal hemorrhages are lessened and finally disappear, after the administration of a few baths. *Gianini* knew this in the beginning of our century and concluded therefore that the cold bath was a true remedy for grave hemorrhages in the first stage of febrile diseases. The later congestions are not influenced as favorably.”

#### THE INFLUENCE OF THE COLD BATHS ON THE RESPIRATORY ORGANS.

On this point *Vogl* says: “If the patients are admitted with the symptoms of bronchitis, these remain of moderate intensity; extreme congestion of the bronchial mucous membrane, and excessive secretions from it do not occur. The patients rarely require a spittoon, only during their stay in the bath they cough up some catarrhal sputum by energetic hawking. There is no acceleration of the respiration and the blueish-red

complexion is absent ; hence hypostatic, atelectatic, pneumonic complications have become a rare occurrence.”

Discussing the influence of the baths on bronchial and pneumonic complication *Tripier and Bouveret* say the following: “Cases treated from the beginning exert a beneficial influence on these complications. The sudden action of the cold bath on the skin stimulates the centres of respiration and excite coughing; furthermore an uncreased activity of the circulation of the blood in the lungs, and an easy expectoration of the bronchial secretion. By lowering the temperature, and making the system almost feverless the cold water prevents weakness of the heart and its dangerous consequences on the pulmonic circulation. The early use of the water treatment therefore acts principally as a prophylactic measure.”

#### THE INFLUENCE OF THE COOL BATHS ON THE DIGESTIVE ORGANS.

“Rapid improvement of the disturbances of digestion is a constant and remarkable effect of the Brand method. In cases treated from the beginning this improvement is a sort of criterion whether the method is applied well, as it ought to be or the contrary. From the first days of treatment on, the fuliginous coating must have

disappeared and the *tongue* have become moist and red. If this does not occur in a case treated early, one ought to look around for possible irregularities and defects in the treatment.

The *mouth* of typhoid fever patients soon takes on almost a normal appearance. The secretion of the salivary glands returns and remains sufficient to keep the mouth moist. The patients are well pleased with the benefit they thus receive. The dryness of the pharynx is a very unpleasant symptom; it depends on an hyperaemic condition of the mucus membrane often covered with dried mucus. Under the influence of the baths mouth and pharynx are kept clean, and the annoying sensations disappear.

Taste and appetite soon return. Patients treated at the proper time partake with pleasure of the nourishment which is permitted them. The general treatment, the repetition of the baths as often as demanded by the intensity and the continuation of the fever, is generally sufficient to produce this favorable result. To bring about however, a rapid improvement, attention must be paid to patients frequently taking fluids, and to his washing his mouth with cold water with each bath. There are exceptions. In two of our 233 cases the dryness of the mouth and tongue persisted throughout the sickness; both had been bathed, one since the 9th and the

other since the 10th day of sickness, in both cases the fever and diarrhoea were marked, both recovered.

The initial *catarrh of the stomach* generally disappears after the first baths. In case the patient had been vomiting, he will after a few baths cease to do so. The changes in the circulation and secretion of the mucous membrane which take place under our eyes, permit the assumption, that at the same time a similar change in the secretion and circulation of the mucous membrane of the stomach is going on. We have, furthermore, a proof for this in the early return of the appetite. The combat with the fever generally lasts three to four days. In this period the patient does not refuse to take broth and soups and desires nothing further. When the period of relative apyrexia sets in, when the thermometric curve desends, when the remission after each bath is deeper and of longer duration, the full appetite returns and soon the deepest concern of the patient is to know when he shall be allowed solid food. After each bath, milk soup without bread broth etc. is given; this fluid nourishment is well borne and digested. Thirst, in the beginning acute, is now moderate. Is this not a proof for the disappearance of the catarrhal condition of the stomach and the return of the normal secretions?

The *diarrhoea* generally diminished in the beginning is definitely suppressed in the course of five to six days. This fortunate modification of the intestinal catarrh is almost constant at least in cases treated from the beginning. — A typhoid fever patient, near the eighth day of sickness, has ileo-coecal gurgling, meteorism and eight to ten liquid passages per day, on the second or third day of treatment he has not more than four to five, on the fourth or fifth day day only two to three passages; and after a week or somewhat later the diarrhoea has ceased; the passages being of normal consistency; at times constipation even sets in. To procure this result it is necessary to cover the abdomen with cold compresses between the bath, besides carrying out the general hydriatic treatment. — Twice we have seen the diarrhoea to continue for a long time, without being influenced in any way by the treatment. These two patients had been subjected to the cool-bath-treatment one from the seventh, the other from the eighth day of the sickness; hence not late in the disease.

The *meteorism* is subjected to almost the same changes as the diarrhoea; it is diminished and disappears altogether after five to eight days. This is the rule. The abdominal wall becomes even and soft. This could be observed in cases of grave character and such as had been



bathed in a late stage. The cold baths augment the tonus of the intestines and favor the expulsion of the gases, not only in typhoid fever, but also in other fever cases.

At times the baths produce abdominal pains which are difficult to explain, but which need not interfere with the continuation of the bathing.

Is it possible for the *Brand* method to have a favorable influence on the affection of the intestines peculiar to typhoid fever? Can it prevent or moderate the ulceration of Peyer's patches? This is a question much disputed and discussed. *Brand* is of the opinion that the method is able to accomplish this, but his opinion is combated energetically even in Germany by the majority of the pathologists; only Hagenbach (Vogl also) believes in a favorable influence of the baths on the local processes in the intestines.

The arguments which *Brand* adduces are worthy of consideration. In the first place it is indispensable that the cold baths be administered quite from the beginning of the disease. It is obvious that the result mentioned can never be expected if the treatment is begun in an advanced stage of the disease, when the infiltration of the plaques has attained a high degree and the stage of ulceration is near at hand. *Brand* lays stress



on the point, that he has only cases in mind that have been under treatment from the start when he writes: "I say, if the patient can be treated and is treated from the promonitory stage to the third day inclusive, ulcerations of the intestines do not occur. For this view I have the following reasons :

1) A patient treated with water from the beginning presents none of the symptoms, which would in any way point to ulceration of the bowels. The mucous membrane of the mouth is moist, the tongue pale and clean, thirst is absent, the appetite stronger than desirable. No meteorism, no gurgling, no pain in the ileo-coecal region. The passages are normal — in short there is wanting every sign of an affection of the intestinal tract.

2) There never occur in such cases the sequelae of the intestinal affection : degeneration, hemorrhage, perforation. In case ulceration had taken place these could not possibly remain in abeyance, nor could the mortality be reduced to such a degree, as it actually is, inasmuch as the hydriatic treatment has no influence on the fully formed ulcer.

3) The statistics of the intestinal hemorrhage show, that all these cases had come under treatment in a later period, — too late. Besides everybody (even those who are not friendly to

the method), affirms, that the earlier the case comes under treatment, the more certain the effect will be.

4) I imagine this is what takes place: Pathological anatomy teaches that the formation of ulcers is not necessary in a case of typhoid fever. In the milder cases, especially those not accompanied by high temperatures, the affection of the glands proceeds only as far as the stage of infiltration and then goes back, without having proceeded to the stage of ulceration.

To this class of cases the typhoid fever treated from the beginning belongs. It takes as mild a course as the mild typhoid fever, and its temperature is even below that of the latter form. What nature does in the one case, art does in the other." (T. & B.)

*Vogl* says the following on the influence of the cool baths on the intestinal tract: "The diminution of the intestinal symptoms is one of the most obvious effects of the cold bath; a short series of experiments with the strict method excluding all medication, will cause surprise by its favorable results. We have seen *diarrhœa* in a degree worth mentioning, only in cases at their admission, after two to three days of systematic treatment, it either ceased altogether or continued for a short time in the form of one to two evacuations daily. If diarrhoea has actually set

in while the cases were under treatment, it has lasted but a few days, with one to two evacuations.

Very many cases did not even have diarrhoea during the whole course of the sickness, but a formed stool every two to three days. More than four diarrhoeic movements are not noted down amongst the whole of our material, not even in the fatal cases.

In the histories of our cases we have classified the dejections into soft, liquid, and formed, and applied to the two former the term diarrhoea; thus we had for our 221 cases, treated strictly, 0.7 diarrhoeic evacuation per day, and amongst these the typical typhoid fever stools were the less frequent.

*Meteorism*, with tense abdominal walls only such cases presented, which had been rather well advanced in the acme; after the first baths this receded, and did not develop further under the water treatment, than to be recognized by percussion in the examination of the spleen.

As is known, *Brand* has ascribed to the early and systematic administration of his method the power to interfere with the development of the intestinal ulcers, i. e. to confine the pathological changes in the glands to the stage of infiltration. The anatomical proof for this view, which I

also accept, is for obvious reasons difficult to obtain, and so is the counter proof.

Watching the course of the disease in cases subjected to hydropathic treatment from beginning to end, one can perceive at once, that from the symptoms pertaining to the digestive tract one cannot form any conclusions as to any anatomical changes, which were used in former times in dividing the disease into periods : in the first week infiltration of the follicles and plaques—accompanied by moderate diarrhoea or often constipation, in the second and third week formation of sloughs in the affected glands—accompanied by more or less violent diarrhoea, meteorism, hemorrhage, and other complications, with entire loss of appetite and the characteristic fuliginous condition of the tongue etc., in the third and fourth week, the stage of defervescence—separation of sloughs accompanied by the sudden disappearance of intestinal symptoms, sudden return of appetite, while the previous diarrhoea and meteorism had existed, at times grave hemorrhages from a torn vessel at the period of the separation of the sloughs, finally cicatrization in the stage of convalescence, accompanied by voracious appetite and constipation. The course of the disease under the cool-bath-treatment does not indicate any connection between the clinical features of the fever and the symptoms due to

the local condition of the bowels, the former is modified, but its type is retained ; the latter are almost wholly suppressed, and, if present, confined to a period of a few days. It may be said, that the cold baths have led the local processes into better paths, just as harmful factors have the power to give them a bad turn."

To explain the mildness of the intestinal symptoms, *Vogl*, in the first place rejects the suggestion, that his cases may have been mild or abortive ones. Of this class, those, which are characterized by a short duration do not form the basis for his conclusions, and are not admitted into the statistics. That his cases were of a grave character, can be seen by the number of baths they required, the length of the fever-acme and the height of the fever at their admission. For a clinical analogy, *Vogl* points to the abortive and mild forms of the disease, where, with *Liebermeister* it may be reasonable to assume, that in the former cases, the infiltration, though intense is of such short duration, that no sloughing takes place, and that in the latter (the mild forms) no ulceration takes place, because the infiltration is not of severe enough a character to reach this stage.

"To accomplish through medical art, what in such cases is brought about by a mild infection or a peculiar resisting power of the indi-



vidual, is the programme and the actual result of the strict methodical treatment with cool baths ; and if one is inclined to accept the view of *Liebermeister* of the rarity of the sloughing in the mild forms even of four weeks duration one cannot reject the view, that in the cases which on account of remedial influences have a similar mild course and the same duration, ulceration occurs just as rarely and in the same small degree — always assuming the early administration of the baths. This is a part of their general prophylactic influence.” (Vogl.)

*Vogl's* view then is : The cool baths have not only an antipyretic effect, by their influence on the circulation they furnish the necessary condition for the affected organs, such as the glandular structures of the bowels to protect themselves, so that the pathological process will stay within certain dangerless limits; this modified process on the other hand will not produce such deteriorious changes in the system in general, and so the bathing process makes out of a severe case a mild case. To explain the clinical phenomena *Vogl* offers the following suggestions : “Just as in other organs and tissues an improvement in the blood current — i. e. an equalization of its distribution—is brought about by the tonic action of the cold baths, this condition is also brought about in the circulation of the mucous



membrane of the intestines ; from such an effect the territory infected by the baccilli, the glands and plaques, cannot be excluded, their tissues which are endangered by disturbances in the circulation and approaching the stage of necrosis can be influenced only in a favorable way by the changes in the blood-pressure-relations, which the persistent application of the cold baths to the surface of the body are able to bring about. The dangerous effects of the mikro-organisms, which are deposited in large number in the deeper layers of the plaques and the mesenteric glands can be thoroughly counteracted until these are eliminated in the typical course of the disease. A shortening of the course of the disease through the annihilation of the pathogenic organisms during their development in the glandular organs by some thermic effect or a specific abortive action can not be ascribed to the cold bath treatment; this method only keeps up the vital processes in the diseased and endangered tissues, which is of course the more readily possible the less the physiological conditions in the diseased parts have been disturbed."

#### THE INFLUENCE OF THE COOL BATHS ON THE URINARY SECRETION.

"If the method is applied early and very regularly, the urine, whatever form of typhoid

fever may be present, generally, after a few days of treatment increases in quantity. Even if the reduction of temperature is moderate and the fever resists the action of the cold, the amount of urine secreted in 24 hours is augmented very strikingly. If, however, the victory is gained over the fever, the amount of urine, sooner or later, according to the more or less severe character of the disease (after the fifth to eighth day of treatment in cases of medium gravity), is increased still more for some days, so that the patient during the period of defervescence, presents considerable polyuria, which continues some days after the apyrexia has fully set in. Not rarely typhoid-fever-patients pass three, four or five litres (quarts, nearly) and we have seen the polyuria increased for two to three days, towards the end of the defervescence to six to seven litres and more. Thus the amount of urine in case . . . . reached 4000 and 5000 cc., and once it exceeded even 7000 cc. in 24 hours.

The following table shows the course of the urinary secretion in a case treated regularly from the fourth day with cold baths according to our own observation.

Day of Sickness.	Temperature.		Amount of urine in cubic centi- meters.	Body- weight.	Number of Baths in 24 hours.
	Mornings.	Evenings.			
4.....	.....	....40,5	.....	58 k 700 gr	.....5
5.....	....39,5	....39,8	.....	50....000....	.....8
6.....	....39,3	....40,1	.....	58....300....	.....8
7.....	....39,4	....39,8	....1680	58....500....	.....8
8.....	....39,1	....39,8	....2050	58....100....	.....8
9.....	....39,4	....40,0	....3450	57....200....	.....6
10.....	....38,7	....39,9	....2700	56....600....	.....6
11.....	....39,5	....39,5	....2900	56....600....	.....3
12.....	....38,6	....38,8	....4500	56....100....	.....2
13.....	....38,7	....38,6	....3500	56....000....	.....3
14.....	....38,3	....38,9	....3400	55....700....	.....1
15.....	....38,1	....38,8	....4000	55....100....	.....1
16.....	....38,1	....38,6	....4300	54....400....	.....1
17.....	....37,2	....38,0	....2700	53....500....	.....
18.....	....37,3	....37,0	....2200	53....300....	.....
19.....	....36,9	....37,8	.....	54....400....	.....
20.....	....37,3	....37,6	.....	55....100....	.....
21.....	....37,0	....37,5	.....	55....900....	.....
22.....	....36,8	....37,2	.....	56....800....	.....
23.....	....37,4	....37,5	.....	57....200....	.....

This was a case of medium gravity. The combat with the fever was carried out well, in the first two days the temperature of the baths had been reduced to 15 and 18° (59 and 65° F. nearly). The patient received 60 Baths. The apyrexia setting in as early as the eighteenth day, was certainly brought about by the thoroughness of the treatment. We consider it exceedingly probable, that the fever would have

lasted longer, if the case had been treated medically or expectatively. We could present other tables, especially of grave and mild forms; we have selected a case of medium gravity. The figures of *Robin* pertain to cases of such character. The comparison is very instructive. *Robin* has found the limits of the amount of urine secreted in 24 hours to be 670 and 2010 cc., the average to be 900—1300 cc. Our figures are far higher; the minimum is 1680, the maximum 4500 and the average 3115 cc. All these figures are higher than the one, which expresses the average according to *Robin*, 1250 cc. The patient therefore always had polyuria. The amount for the first three days is, we are sorry to say — not known, but on the eighth day, while the temperature was still 39.1 to 39.8 the amount of urine was already increased to 2050 cc., which is higher than the maximum quantity of *Robin*. Our maximum of 4500 cc. is reached on the twelfth day, when the temperature had been falling only two days. Finally the polyuria is still very marked when the apyrexia sets in on the eighteenth day.

This urine secreted in such abundance is pale and resembles in many cases very much that of interstitial nephritis. Its specific gravity sinks to 1010, 1008, 1005 and even 1002. The minimum of *Robin* was 1008. This modification

of the specific gravity may set in rapidly even after a few days of treatment.

Recent investigations in the pathology of the infectious diseases have thrown light on the role, which the function of the kidney plays in these diseases, and have shown that this is of no little importance. It may be said that the condition of the kidney has as much influence on the prognosis as the condition of the heart. By means of the kidneys the products of the febrile combustion are excreted, their retention in the blood of the fever-patient is the cause of the adynamia and the typhoid condition, which are found in the majority of the infectious diseases. The kidneys probably excrete the pathological micro-phytes and the dangerous products of their growth in the tissues and fluids of the body (*Bouchard, Lépine*). To favor the excretion of these dangerous materials by the kidneys, or in other words, to keep up and augment the activity of these glands, is one of the first tasks which the treatment of enteric fever has to fulfill. Far better than by any medication this is accomplished by the method of *Brand*. From the first days of treatment on, the urine is increased in amount, and soon partakes of the character of the critical urine. Nor does the cool-bath-method require the introduction into the system of, and the saturation of the blood with more or less



dangerous drugs, the necessary excretion of which by the kidneys might endanger their integrity." (T. & B.)

*Vogl's* words on the action of the baths on the kidney are the following: "The condition of the kidneys in the cases treated methodically with cool baths shows itself by the increased function of this organ. Even in our first experiments in the quantity of the urinary secretion in comparison with former times was noticeable, and became more obvious the more perfectly and strictly the bathing was carried out.

The measuring of the urine furnished by our fever-patients has been carried out systematically for many years in the frame pavilions with reliable accuracy; the results have been recorded daily.

The first amount measured generally contains the patients urine for twelve hours, because ordinarily the patient is admitted by noon or somewhat later; the subsequent measurements refer to a period of 24 hours from eight o'clock in morning to the same hour next day. The volume gathered in the first 12 hours amounted to 700—800 cc., of a dark, deep-yellow urine, turbid only at times from precipitated urates; the smallest amount was 300—400 cc. (in twelve hours).



From the second day on, or one of the days following, throughout the whole acme and defervescence, we have observed in almost all cases polyuria, and selecting any year at haphazard, on the average 2900 cc., of clear and light colored urine, while the maximum and minimum was 4000 and 1200 cc.

The increase in the quantity of urine is obviously to be ascribed to the cold baths, although the patient received at the same time larger amounts of fluid; a decrease occurred only, when diarrhoeic evacuations took place, which, as has been mentioned, has been a rare occurrence. The quantity of urine secreted during the period of the acme under the cold bath treatment, was greater than under symptomatic treatment in the period of defervescence and convalescence. Worthy of mentioning, and supporting the view proposed, was a case, who in spite of high temperatures throughout the acme, did not receive any baths, because the diagnosis, "enteric fever" on account of continuous pain in many joints, resembling rheumatism, with impure heart-sounds, could only be made in the period of defervescence on the strength of the steep curves; the quantity of urine in this case amounted to 1000—1300 cc. and never more.

As far as the albuminuria is concerned, the urine of each patient was examined once in the

morning for albumen; amongst the 221 cases it was present 14 times in form of a turbidity consisting of small flakes without any casts; it decreased on the next day or the days following, that is at a time when the polyuria was not as yet present in a marked degree, and disappeared when the same was fully developed.

The influence of the baths on the renal circulation undoubtedly can be called a beneficial one; this can be proven by the polyuria, the disappearance of the albuminuria, and the entire absence of nephritic processes in a later stage of the disease; one may even ascribe to the cold baths a prophylactic effect against such kidney diseases as are apt to occur as complications of other affections. This is shown by my experience in an epidemic of scarlet-fever occurring amongst the soldiers three years ago: on account of circumstances one part of the patients was treated expectatively the other part—the cases all being of the same type and the same gravity—throughout the acme with cold baths (a bath of  $16\text{--}18^{\circ}\text{R.}$  ( $68\text{--}72.5^{\circ}\text{F.}$ ) every three hours at a rectal temperature of  $39^{\circ}\text{C.}$  ( $102.2^{\circ}\text{F.}$ )

Of 69 patients subjected to the cold-bath-treatment, five had nephritis, of these there died 0.

Of 56 patients not treated with water, nine had nephritis, of these there died 5.

## THE INFLUENCE OF THE COOL BATHS ON THE SKIN.

It is known how frequent and unpleasant a complication decubitus in grave cases treated medicinally is, accompanied by undermining abscesses, which often endanger life and retard reconvalescence. It is one of the greatest merits of the *Brand* method, to cause this unpleasant symptom to disappear or at least to make it a good deal less frequent. In our hospitals at Lyon the decubitus of the sacral region is an exception; to a greater degree is this the case in private practice where the treatment has been carried out from the very beginning.

The baths reduce the frequency and the abundance of the perspiration : sweating in the course of the water-treatment is a rare exception and even in the stage of the crisis is more frequently missed than observed. (*Brand.*) Since we have treated our cases with cold baths, we have not observed a sudoral form of typhoid fever. A typhoid-fever case bathed regularly: The skin is soft and slightly moist; its color is normal and only rarely it is covered by a moderately abundant perspiration. Hence sudamina are of rare occurrence. If perspiration is nevertheless produced, it generally occurs at the time of the disappearance of the fever, when the baths are not necessary any further. As we have

seen, even profuse perspirations are no contraindication for this method, that is during high fever.

Not rarely in the course of the treatment, generally, however, in the period of defervescence, a bright red discoloration makes its appearance on the extremities, nose, ears, hands and feet accompanied by slight tumefaction of the skin glistening and smooth in character. This reddening is often accompanied by a sense of burning, pain in the joints and oedema of the extremities. The red spots are pronounced after the bath during the the time of reaction but disappear after some hours. This vaso-motor disturbance is nothing of the nature of a complication ; it is an unimportant accident devoid of danger.” (T. & B.)

#### THE INFLUENCE OF THE COOL BATHS ON THE NERVOUS SYSTEM.

“Headache is constant even in mild typhoids, as a rule it disappears after the first baths. The patients are well aware of this, and on this account are not unwilling to have the treatment continued. In grave cases, the headache lasts longer but is always moderated as soon as can be expected. Together with the headache, the *irritability of the senses*, hearing and sight is diminished or ceases altogether. If the tinnitus

lasts longer or sets in in the stage of defervescence it is more apt to depend on a catarrh of the eustachian tube than on an irritation of the nerve centres. The quieting effect of the bath is the cause of *sleep*. In mild cases sleep returns after a few baths even, in grave cases after five, six or eight days, not only now and then, but the sleep is lasting and refreshing. The patients will complain bitterly about the severity of the treatment, which demands the bathing even at night. These complaints must of course not be heeded, because the fact that the bathing is carried out regularly even at night is the cause which has enabled the patient to regain the capacity to sleep. A very few minutes after each bath the patient goes to sleep again, and it is not correct but unjust to accuse the *Brand* method of disturbing the rest of the patients. This quieting of the disturbed functions of the nervous system modifies in a happy way the whole clinical picture and outward appearance of the typhoid fever. Few diseases furnish such a characteristic facies as enteric fever. It is often easy to pick out a typhoid fever case from amongst other cases. In our hospitals in Lyons such a diagnosis is more difficult, and the most skilful observer is exposed to frequent errors. Directly after the bath the face is more or less collapsed, lips and cheeks are slightly cyanotic, the whole



body shivers from cold, his teeth shatter, and considerable time has to elapse before the patient regains the look and expression peculiar to typhoid fever. which generally is quiet and natural in the interval between the baths. Relieved from the insomnia and the head-ache the patient has a feeling of *bien -etre* which is unknown under any other method of treatment, and which is an inducement to a continuation of the same, inas-much as through its instrumentality the patient in cases not of the most severe type, passes through the disease in the illusion of perfect health.

Early *delirium* generally indicates a grave form of the disease. It is often accompanied by high temperatures and an accelerated pulse ; nevertheless at times typhoid fever patients are delirious in the first days, without their fever being high or the pulse very frequent. This form of disturbance of the central nervous system yields to the cooling process better than to any medication ; if—what seldom is the case—the delirium continues nevertheless, this is an unfavorable prognostic sign. In the type of enteric fever, where delirium is one of the prominent symptoms, the cold water treatment has its most brilliant triumphs.

Quite often after the first baths even, the delirium vanishes. The restlessness, however,



reappears in proportion as the immediate effect of the bath passes away, i. e. when the temperature rises anew. After two to three days of regular treatment, rarely later than that, the patient regains his full consciousness, knows his friends and answers questions correctly. — The effect is less prompt and complete when the disease has advanced to a later stage, and when the delirium has lasted several days before the treatment is instituted.

The grave and delirious forms are accompanied at times by symptoms of irritation in the *motor sphere*: rigidity of the muscles of the nape and back, contracture of the extremities and eclamptic convulsions. In nervous women there occur not rarely during the first days hysterical convulsions. Similarly as in the case of the delirium these motor disturbances under the influence of the baths, are diminished and finally disappear.

*Stupor* and *coma* are graver symptoms than the preceding ones. Before the introduction of the *Brand* method all the enteric fever cases were doomed that were attended by coma from the beginning. In these grave cases the method if applied early and systematically, at times yields unexpected results. Generally, however, the removal of the coma can be brought about slowly only and with difficulty. One of our patients (bathed from the fifth day on) was

placed in the bath in the midst of his coma ; on the next day already he came to, and remained clear in his mind. Two other cases with this complication (one bathed on the fourth, the other on the eighth day) died; in one of the cases the unconsciousness continued in spite of the cold water, in the other the coma disappeared after the first baths, but progressive adynamia led to a fatal issue.

Improvement and even total disappearance of the gravest nervous symptoms do not always coincide with the reduction of the temperature. We often see delirium and ataxia disappear, when the fever remains high, and has not yet yielded to the cooling process. It is probable, therefore, that the cold water has a direct action on the nervous system, independent to a certain degree of the abstraction of heat." (T. and B.)

Vogl describes the influence of the cool baths on the nervous system thus: "The change in our typhoid-fever-patients is brought about from the first and second days on, and the stupor and depresssion are replaced by fresh vitality of the nervous system after the baths of the first night: the patient answers promptly and correctly and expresses himself as satisfied, he can perform all actions and movements, eats without aid what is offered to him and sleeps quietly, though per-

haps not a long time etc. In correspondence with the effect of the baths on the temperature, respiration, pulse, the condition of the patient, which the evening before hardly admitted any doubt as to the diagnosis, seems to have become doubtful especially where tumefaction of the spleen, roseola, diarrhoea etc. have not aided in establishing the diagnosis. A single observation of this kind, and of the certainty with which such a change is brought about after four to six night baths is sufficient to enable any one to recognize the relation of cause and effect and to convince him that a thorough continuation of this therapeutic measure must be successful in moderating the further course in a similar way and in confining it within certain limits.

It can be affirmed and proven by experiment that a systematic and energetic administration of this treatment can preserve the integrity of the functions of the central nervous system throughout an acme of one to four weeks, mild delirium is an exception, and the versatile and stupid forms of enteric fever are never developed, so that this distinction for clinical purpose has no further value, nor can it be employed as an indication for warmer or colder baths. It hardly ever happens that a patient soils the bed or the bath, he asks for the chamber, the urinal, retention of urine which formerly so frequently

required the use of the catheter is unknown, the patient sleeps in the intervals between the baths and rests on his side, he takes plate and cup in his hand, taking his meals, he is able — though not permitted to do that—to go to bath, with staggering gait however, remains sitting in the bath rubbing himself continually with his hands etc.

There never is an indication offered to combat states of irritations with narcotics. Since 15 years it has not happened that a typhoid-fever-patient has left his bed, or become violent against himself and others. We have not observed any nervous diseases or psychoses as sequelae.

But we must remark that the full vigor only of the treatment can achieve what has been presented here and an interruption of the treatment either on account of some indication, or for the purpose of experiment, soon permits the case to assume those features which have been kept in abeyance by the administration of the baths.

It is an open question, whether in typhoid-fever the disturbed function of the heart or of the nervous system, do furnish the greater danger to life. But inasmuch as the anomalies of the nervous system in the typhoid stage give a good picture of the intensity of the infection and inasmuch as these anomalies can be kept down

or removed altogether through the stimulating effect on the nervous system brought about by the cold baths and kept up by the systematic continuation of the treatment, the chief function of any therapeutic measures consists in combating the nervous symptoms and the hydrotherapeutic method herein excels all others. The suppression of the status typhosus is the first link in the chain of favorable therapeutic results, necessarily followed by diminution of the complications and a lowering of the death-rate. *No statistics on the mortality of enteric fever can be interpreted in favor of a therapeutic method, which allows the status typhosus to continue undisturbed.*”

The independent testimony of these observers will vouch for the correction of the description of the general course of the disease which *Brand* gives in the following words : “The picture of the disease under the water treatment is quite a different one from that which we find in the books. One may say that as the typhoid fever process only, if not disturbed by art, will allow the phases through which it passes to appear in a certain purity, so under the hydiatic treatment, it presents itself free from complication due to accidents and unavoidable contingencies as a quite different being. On the one hand there is observed a general diminution



of the severity of the symptoms, while on the other some of the symptoms are lacking altogether giving room to a series of new and unusual ones, and yet the picture in its totality shows all the characteristic features of the maldy indicating the nature and essence of the typhoid-fever-process, and corresponding to the facts of pathological anatomy. Even thus purified and uncomplicated the disease allows us to recognize the signs of an intense blood-disease. The irritation of the brain and nervous system comes under observation, so do the pathological changes of the mucous membrane of the intestines and the lungs, the tumefaction of the spleen, the roseola and the exacerbations of the fever, *but all in all the intensity of these symptoms does not exceed a certain low degree which does not call forth any apprehension*, and even the diminution of the body weight keeps within certain reasonable limits. To mention examples in advance, one fails to observe in cases under hydriatic treatment, those characteristics which allow the disease to be distinguished at first sight, such as the typhoid look, the stupid expression, the “decomposition” of the features, the bluish-red cheeks, the open mouth, the crusts on the lips, the sordes on the teeth, the dryness of the tongue, while the symptoms which otherwise determine the diagnosis of typhoid fever, such as



the diarrhoea, the ileo-coecal gurgling and the more or less developed meteorism are not apt to reach a higher degree than that belonging to a simple intestinal catarrh. Thus it frequently happens that a typhoid fever patient with highly developed symptoms, when subjected to the water treatment, presents such marked changes in the character of the disease, that doubts as to the correctness of the diagnosis are very apt to arise in the mind of the attending physician.

The modifications in the course and symptoms of typhoid fever as brought about by the hydriatic treatment demand a change in the description of this disease, and, furthermore, demonstrate that all those processes described under the head of complications and anomalies peculiar to the typhoid fever process are by no means necessary but sequelae only of unfortunate contingencies, which can be avoided by the simple water treatment. And the very fact that the occurrence of these so-called anomalies can be prevented by simple external influences, supports the view that they are not an essential part of the typhoid fever process. If they were, they could no more be prevented from making their appearance than the other symptoms..... If the hydriatic treatment is carried out systematically, severe hemorrhages, intestinal perforation, peritonitis, abscesses, mortification etc. are never

met with, excepting the case that complications existed before the water-treatment was instituted.

This powerful influence of the water on the typhoid-fever-process does not only furnish an interesting spectacle to the astonished observer, the patient also becomes cognizant of the fact. .... The typhoid-fever-patient treated with water never is as sick as the one treated with medicines, never does his power of judgment leave him as entirely, that he should not be able to give information about his condition, or converse on the status of the disease and its requirement, never does the general weakness reach such a degree, to make it impossible for the patient to execute such ordinary performances as changing his position in bed, eating, drinking etc. If I am not greatly mistaken, this remarkable fact makes the same impression on every physician as on myself. Each new case, and the daily observation furnishes so much of what is unexpected, and which differs from the customary picture of typhoid fever so plainly, that artificial or fine means of observation for their observation are unnecessary.

As far as the *duration of the fever* is concerned there is no marked difference between medical and hydriatic treatment, and I believe I was right, when in the first edition of my work

I said ; that the duration of the disease proper does not differ materially whether one or the other method is employed. But the total duration of the disease is another matter. Under medicinal treatment this lasts on the average 8—10 weeks, and even then the patients have not regained their old strength. Under hydiatic treatment the average duration is 40—45 days. An important shortening of the period of convalescence by means of the hydiatic treatment can therefore not be denied.”

#### RESUME.

1. The cold bath of 20—15° C. (59—68°F.) will reduce the temperature of the fever about 1° C. (1.8 F.); after one-half to one hour the temperature will rise again.

2. The effect is more pronounced in children than in grown persons, more in a late than in an early stage of the disease, more in mild than in severe cases, more after the treatment has been carried out some time than after the first baths.

3. A pronounced reduction of the temperature, while generally a favorable sign, must be accompanied by improvement in other symptoms to be of absolutely good prognostic significance.

4. The cold baths will stop the rise of the temperature, and reduce the fever from day to

day more or less rapidly according to the gravity of the case.

5. The influence of the baths on the circulatory organs is, to make the pulse slower and stronger, check early hemorrhages, to bring back the tonus of the blood-vessels, to prevent or remove the dirotism of the pulse.

6. Diarrhoea and meteorism are checked, coated tongue and dry lips will disappear — the appetite and digestive functions are kept up by the baths.

7. It is probable that an early and systematic administration of the method will prevent ulceration in the intestines.

8. The cool baths cause the secretion of a large quantity of pale urine of low specific gravity.

9. Sleep is produced, delirium, headache and restlessness are made to disappear, at times before the temperature is lowered, coma and stupor ameliorated by the baths.

10. The hydriatic treatment keeps the pathological processes within safe limits, thus making a mild case out of a grave one and making a mild case still milder.

11. The water treatment does not shorten the duration of the disease excepting by pre-

venting complications and shortening the period of convalescence by means of preserving the strength of the patient.

## CHAPTER III.

### Indications and Method.

In this chapter there will be discussed the indications for the treatment after Brand, then the method of carrying out the treatment in general and in normal cases will be described, under this head the number, temperature duration of the bath etc. will be considered, the next section treats of special condition, the treatment of children and older persons, (after T. & B.). As far as the late critical and complicated cases are concerned, it was first my intention to say very little on this topic, and to refer the reader to the writings of Brand and Tripier and Bouveret. But inasmuch as the former are out of print and there may be not much to be found in the English language on this matter, I have decided to treat this topic more extensively, particularly, as Dr. Brand was kind enough to revise, what he has to say on the treatment of the degenerated cases in his second edition, for this volume. On this topic I have given passages both from Brand and Tripier & Bouveret. The chapter ends with a short section on hygiene, diet and medication.



### THE THREE INDICATIONS. (BRAND.)

“The general indication in the hydriatic treatment of typhoid fever is to combat the fever, to keep the daily temperature at an average of  $38.5-39^{\circ}$ ; the most appropriate means to remove and prevent the fever exacerbations are the cold bath.

If this is repeated as often as the temperature reaches  $39^{\circ}$ , it is possible to keep the patient almost in an afebrile condition, in consequence of which the organs carry on their functions in spite of the infection in an almost normal way, and the processes of nutrition (tissue changes) are carried on quite regularly.

This indication holds good for all typhoid fever cases, inasmuch as the disease is always and everywhere the same. Neither nationality nor climate nor sex, age, condition of life, individuality, greater or less development of the progress make any difference, nor does the presence of primary complications do so. Never indeed should a typhoid fever case be allowed to suffer from the fever or its consequences even if heart, lung or other chronic diseases should complicate it.

From this condition of things, there follows a number of principles, which each man who in-

tends using this method should make the guides for his actions.

1. *The hydriatic treatment of typhoid fever is not a remedy in the full sense of the word as e. g. Mercury against Syphilis, Quinine in intermittent fever.*

The effect of the hydriatic method is best named a prophylactic one.

The fever if left to itself, produces new changes every moment, consequently the longer it lasts the greater must be their number and significance.

The certainty of the result of the hydriatic treatment is therefore conditioned and limited by the time of its commencement and dependent on the greater or lesser development of these changes and their character.

He, who is of the opinion that the hydriatic treatment might and must be able to help in each stage of the disease, is involved in deplorable error. *Only when the harm which is done is of relatively minor importance, when the fever only is still the important factor in the problem, aid can be expected and demanded from the hydriatic method in the later stages of typhoid fever.*

It is true there are cases on record, in which the effects of the hydriatic treatment have shown themselves in a later stage, in the time of great-

est danger, when everything seemed lost. Mr. Behier has published such cases in the *Bullet. général de Thérap.* June 15, 1874 as well as I myself in the present volume.

For him, however, who is able to judge, there is no doubt that chance had a hand in these cases. But upon chance no conscientious physician should rely. For the welfare of the public and the fortune of the hydriatic treatment it were better if such resurrections would not occur—they do no good and confuse the minds of the public.

This first proposition furnishes the basis for judging all statistics pro and con, the hydriatic treatment drawing the lines accurately within which it can be made responsible for success and the contrary. On the other hand it counts for nothing those statistics which do not pay attention to the real condition of things and the limits which have been pointed out.

If e. g., as has been done, the cases which under medicinal treatment have assumed a grave form or in general the grave cases (in the latter stages) of any hospital are subjected to hydriatic treatment for the purpose of studying its efficacy, this is taking a wrong view of the question under consideration. The hydriatic method is neither to be made responsible for these *enfants perdus*, nor does it exist to repair the damages,

which the mistakes and omissions of medicinal treatment have allowed to arise.

If furthermore the results obtained from such cases are compared with those obtained from the mild cases not treated with water and thus a judgement should be formed on the water treatment which necessarily would not be in favor of the same, such judgment would be as false as it is unjust.

The object of the water treatment is exclusively to force the disease into a normal course, and by keeping down the fever to prevent the degeneration of the process and the formation of complications.

The consequences of the uncombated fever are not the object of the hydriatic treatment.

2. *The hydriatic treatment must be carried out from the beginning (dès le début) of the disease to insure perfect results.*

This demand of mine has been misunderstood by many. The opinion has been held that this beginning covered all of the first week.

This is not correct. The beginning of a disease which at times proves fatal on the third, fourth or fifth day cannot by any means be extended to the eighth day. The beginning of typhoid fever is confined to the premonitory stage and the first three days after the occurrence of the chill.

In 144 fatal cases, the hydriatic treatment has been commenced on the

1st day.....	0 times.
2d “ .....	0 “
3d “ .....	2 “
4th “ .....	5 “
5th “ .....	11 “

with the increase of the days the number of deaths increased.

If the hydriatic treatment is to have perfect success, it must have been begun during the premonitory stage or within the first three days. The third day may be included for reasons which will be mentioned later.

The objection will be made, that typhoid fever cases do not come under observation at an early date. This is correct as far as the hospitals are concerned, but not in private practice amongst the better classes. It is an exception if one is not called in the prodromic stage or after the chill. The foregoing proposition will hold good particularly for private practice.

Another objection which has been made is that at this period the diagnosis is not yet certain. The correctness of this objection cannot be disputed, but *the very suspicion of typhoid fever is an indication for the hydriatic treatment.*

If the further development reveals, that the case was not one of typhoid fever, so much the better.

The former apprehension that a cold bath might be injurious in a case of pneumonia, of the acute exanthemata, of any febrile disease, has been converted into the knowledge that the anti-pyretic effect of the cool bath is as much to the purpose in these cases as in typhoid fever and that the indications for such treatment is as imperative in the affections mentioned as in typhoid fever.

A catarrhal or gastric fever under this treatment takes a much milder and for the patient a much more pleasant form, than under ordinary treatment.

*Riegel* writes on this point: "As has been remarked the period of time, in which the patient comes under treatment is of the highest importance for the success of the hydropathic treatment. Time and again one can convince oneself, that any given case will take a course the milder and quicker, the sooner the patient has been treated according to hydrotherapeutic principles. We therefore follow the rule to subject every case to cold-water-treatment as soon as the diagnosis of typhoid fever is certain. (Vogl, who has achieved such splendid results, and even his house physicians, without any special orders, begin the



treatment even before the diagnosis is certain). I do not wish to antagonize by this statement those, who use the hydriatic method even before the diagnosis is beyond doubt. Such a course on the contrary is fully justified, and we also subscribe to the principle that in any sickness in which the fever attains a considerable height or is of considerable duration the cold-water-treatment is not only justified but is one of the best antifebrile remedies at our command. For a long time we have convinced ourselves, that there is not the least harm done, if pneumonia and one of the acute exanthemata or any similar febrile affection is treated altogether according to hydrotherapeutic rules. It is not a rare occurrence that pneumonia, the acute exanthemata and other similar cases are treated with hydrotherapeutic processes in our clinic, of course only, if the high fever demands such an energetic procedure. No reproach therefore can be offered to those, who use hydrotherapeutic procedures in a stage, when the diagnosis of typhoid fever cannot positively be made, inasmuch as no dangers follow this method in cases attended by high fever."

3. *Every case of typhoid fever, whether grave or mild, is to be treated with water.*

The reasons for this demand are, that in the beginning of a case of typhoid fever nobody can

know, whether it will take a mild or severe course ; — that the certainty of success becomes doubtful at the time, when such a distinction can be made (eighth to twelfth day) and that even for a mild case of typhoid fever the hydriatic treatment is the most useful.

To my astonishment I see that this fundamental principle has been vigorously attacked in France. In Germany (*Wunderlich*) it has not been followed, but attacked it has not been by any one.

Mr. *Liebermann*, physician to the military hospital Gros-Caillon in Paris has adduced the the following objection: (Union médicale No. 97 etc. 1874). “The whole world knows,” says *Liebermann*, “that of 100 cases of typhoid-fever 80 will recover.

Of 100 cases during an epidemic 50—60 are mild ones, which recover without any treatment, excepting the use of hygienic measures. Therefore in one case out of two and in certain times in two cases out of three the baths are useless.

The first indication then is to observe it for the grave forms.

But by which means can we arrive at a conclusion as to the gravity or the benign character of a case of typhoid fever before the alarming

symptoms appear in connection with lesions often irreparable?

In the first week it is altogether impossible to know, whether the fever will be grave or benigne, but about the eighth to twelfth day one can reach a conclusion with a sufficient degree of probability. In this period it is time enough to commence the treatment and to obtain all the good effects which it will yield."

To this the objection may be made, that the idea of confining the hydriatic treatment to the grave cases has its full justification. I am familiar with it. Twelve years ago I wrote in my pamphlet (*Zur Hydrotherapie des Typhus*, Stettin 1863) the following: "*Grave cases of typhoid fever must be treated with water in order that one may be without apprehension on the issue of the case. There are however a multitude of cases of a milder form, which, as I am well aware of, do not require such energetic treatment for a happy issue, which, inasmuch as they recover spontaneously, are not in need of any medical interference. But who knows of any reliable sign, in the beginning of a case of typhoid fever, that will insure a mild course. Who does not know that apparently mild cases suddenly assume a grave form?*"

Between *Liebermann* and myself then, any one can see, there is the fullest harmony of opin-

ion, that the 20 percent which amongst the 100 cases under ordinary treatment end fatally are the proper object for the hydriatic treatment, and further, that in the first week it cannot be ascertained, whether the course of the disease will be a mild or a grave one.

Regarding, however, the other points, whether one can depend on a favorable outcome, if the treatment is begun after the eighth day and whether the cool bath in a mild case is useless,—in this matter our opinions are greatly at variance.”

Quoting statistics that show that death is rare if treatment begins before the fourth day and that the mortality increases with each day that the treatment is begun later, *Brand* adds : “The assertion that one is allowed to defer the water treatment until after the eighth day and that the result is certain then, cannot be sustained and its incorrectness cannot be better illustrated than by such figures.”

*With the third or the fourth day the physician looses control of the disease, which henceforth takes the course it chooses.*

Statistics show, that amongst 8141 cases two cases died, which came under treatment on the third or second day. One died the same day, the other unwell for eight days and confined to bed one day presented such mild symptoms, that

baths hardly have been given. I believe therefore, that both can be excluded and that the third day fixes the limit beyond which one should not wait to begin with the treatment.

*If treatment is begun within this period one can in general depend upon that the patient will recover, inasmuch as it seems that complications do not occur."*

Presenting a table showing the day on which the water treatment was commenced and giving the complications and their number, *Brand* adds: "The earliest point of time in which the water treatment was begun to be followed by complications was the sixth.

*All other cases which came under treatment earlier took a normal course, without complications, and in the course of eighteen years I have never seen any pneumonia or intestinal hemorrhage develop under these conditions.*

This fact is of the highest significance throwing a flood of light on the mode of action of the hydiatic treatment.

Not recognized by other observers they have a presentiment of it, for all affirm, that the results are the more certain, the earlier the treatment is instituted.

In fact everybody who wants to treat typhoid fever with peace of mind and without reproaches and who wishes to have reliable results



will have to satisfy this fundamental principle, and emancipate himself from the erroneous opinion, that mild symptoms in the first stage of typhoid fever will allow a procrastination in the application of the method. The very worst, the insidious cases, (Ziemssen) are apt to begin with low temperatures and mild symptoms, when suddenly irreparable sequences follow. In seven of my fifteen fatal cases the physicians who had been treating the cases previously excused themselves for neglecting the method by the apparently mild course of the disease.

Necessarily this principle has its limitation in the circumstance, whether it is possible that the patient be treated according to the method. In private practice this would seem possible, not however, in hospital practice.

Mr. *Liebermann* calls the bath useless in mild cases.

My honored colleague has perhaps never had typhoid fever himself, and not experienced how unpleasant even such mild forms are for the patient. The lassitude, the headache, the feeling of oppression and the decubitus produce sufferings severe enough.

And to bring relief here the materia medica furnishes no remedy.

The cold full-bath however, or still better, the luke-warm half-bath with cold affusions of



such short duration that no chill occurs, of ten minutes duration, two to three times daily, (a more frequent repetition the fever does not demand) will soon put a different face on the sickness. With each affusion the feeling of oppression will disappear, so that the patient cannot get enough of the affusions, the strength soon returns and instead of the weakness a genuine *euphoria* returns. A patient treated in such a way need not even remain in bed, but can rest on his couch in the open air, he reasons, converses, eats as under normal conditions and is allowed to smoke if he should choose to do so. The course of the disease is shorter, the strength is preserved and further infections are rare. The physician, the family are spared work, care, grief, sorrow, and such a remedy for which I can claim all these things from personal experience is to be called useless?"

#### EXECUTION OF THE METHOD IN NORMAL CASES.

It is not the purpose of the author to enter into any theoretical questions concerning the physiological *modus operandi* of the hydropathic method. But for practical purposes one may distinguish the following two main effects: the antipyretic and the stimulating. One might also call the cool-bath-treatment a protective method

meaning by this that through the influence of the often repeated baths, the different organs are guarded and shielded from the injurious influences of the poison, so that the pathological changes induced by the same, remain within safe limits, allowing the organs affected to swing back to their healthy normal condition after the poison has done its work. The reduction of the high temperature is certainly one of the most certain and useful effects of the hydriatic method. Although the observation that typhoid fever of grave form may run its course without any elevation of temperature, has demonstrated that high temperatures are not the only dangerous pathological condition, yet in ordinary practice high temperatures furnish, if not in themselves dangerous, a reliable indication of how the tissues and organs of the body are affected by the poison. It would seem further not illogical that if a method of treatment has the power to bring back the heat-regulating organs to their normal condition it may have a similar influence on some of the other protoplasmic structures just as important to the maintenance of life as, the respiratory centre, the nerves governing the heart and those regulating the flow of the blood and the nutritive fluids of the body. In his first edition Brand points out the “stimulating” effect of the bath before mentioning the antipyretic. As a matter

of fact the beneficial effects of the bath can often be observed before the reduction of the temperature has been accomplished.

The increase of the amount of urine may further be of aid in removing rapidly from the system the products of retrograde metamorphosis and the poisonous substances produced directly or indirectly by the morbid agents, and the afflux of blood to the skin after the bath may relieve internal organs from congestions. We can thus speak of a derivative effect of the baths.

*Brand's method.* Describing this I shall give the words of *Tripier and Bouveret*, with some unimportant omissions, so that the practitioner may have the best authority, if he should be inclined to try the method.

‘‘Since his first publication *Brand* endeavored to combine the most simple and most effective procedures of applying cold water to meet as thoroughly as possible the fundamental indication : to keep during the entire course of the disease the body temperature at a moderate degree, and all the organs in a condition allowing them to carry on their normal function. In his second edition of 1877 he recommends instead of the cold affusions in the luke-warm bath, which he had been using formerly, the cold full bath. The general formula now is : *A cold bath of 20° C. (68° F.) and of 15 minutes dura-*

*tion every three hours as long as the temperature of the patient reaches 39° C (102.2 F.) in the rectum.* This formula is applicable in the majority of cases. It is however not absolute and has to be modified according to the individual condition of the patient, depending on the intensity of the fever, the stage of the disease and the nature of the complications.

#### EXECUTION OF THE METHOD.

*The cold full bath.* The quantity of water in the tub must be sufficient to cover the patient up to his neck; this is often neglected. It is necessary that the chest should be completely covered. Before each bath the temperature of the water is to be tested by the thermometer and warm or cold water to be added as the case may be. It is not necessary to renew the water for each bath, if not contaminated by the patient, it will not require a change for one to two days. The tub is to be placed alongside of the bed at a distance of three to nine feet.

The patient steps into the bath himself or is lifted into it. The unpleasant sensation of passing into the bath may be ameliorated by sprinkling the face and chest with water colder, than that of the bath. If the patient is weak or not far from fainting, he may receive a glass

of wine before entering the bath. (I *always* give a glass of punch, coffee, wine, whatever the patient may prefer, before he enters the bath.)

In the course of the bath affusions to the head are always to be made; they are always useful and necessary in cases with grave nervous symptoms. *Brand* recommends three affusions of two to three minutes each, one at the beginning, one in the middle, and one at the end of the bath. We prefer to use those affusions almost continually throughout the bath. In mild cases the water out of the tub may be used, in cases with nervous complications colder water is to be preferred, the colder the more intense the delirium and the deeper the coma. A vessel provided with a spout or an ordinary sprinkling-can will answer the purpose. The hair is to be cut. If a female patient does not wish to sacrifice them, they have to be plaited and pinned up, although the cutting off would not be much of a sacrifice inasmuch as the hair will fall out even if the water treatment is carried out systematically. During the affusion the water, while running down the face and entering eyes nose and mouth produces unpleasant sensations; this may be prevented by placing a folded pocket-handkerchief around the head, knotting it behind; the water which is poured on the head will now run down behind over the back of head



and neck. The affusions are made slowly but plentifully.

*Brand* recommends also to rub the chest and limbs (*Vogl* advises a large sponge) with the hands while the patient is in the water. This operation is not as necessary as the affusions, but may be of service during delirium and coma. In the middle of the bath the patient drinks a glass of cold water.

Not unfrequently especially at the beginning of the treatment the patients make complaints, are restless and ask for the discontinuation of the bath, as a rule the physician is present at the first bath; he has to quiet the patient and encourage him with kind words to hold out.

The bath lasts 10—20 minutes. In grave cases with high resistance to the reduction of temperature the patient is allowed to feel chilly in the bath for a few minutes. Soon his whole body shivers, his teeth chatter and the patient complains considerably about the sensation of cold which he experiences; this is a sign that the central temperature begins to fall.

According to the strength of the patient, he either steps out of the bath or is lifted out. He next is dried off; put to bed and his legs up to his knees are wrapped up in a woolen blanket.



If he complains much of the coldness a jug of hot water is placed against his feet. The rest of the body in summer is covered with a linen sheet, in winter with a double woolen blanket. We often have seen badly instructed nurses wrap up the patient in wollen blankets and throw more over him while in bed. This is bad practice, only lessening the full benefit of the bath. It is well for the chill to continue some time after the bath. During the fever our patients wear nothing but a shirt, during the stage of defervescence or reconvalescense we order woolen under clothing if such has been worn before.

Twenty to thirty minutes after the bath the temperature ought to be taken again, which is necessary to gain a correct insight into the effect of the bath, and for conducting the treatment. The introduction of the thermometer is attended with little difficulty, if the patient, after coming out of the bath is placed on his side, a position which he is apt to assume spontaneously as soon as his condition is improving.

After the cessation of the chill, the patient feels very comfortable. This happens about 15—20 minutes after the bath and is a very convenient moment for the administration of nourishment, consisting of thin soup (broth, milk) some pure water, or water mixed with wine.

Quiet now reigns, and sleep often sets in, which ought not to be disturbed, neither by noises nor unnecessary visitors.

*Cold compresses.* *Brand* notwithstanding the criticism of *Jürgensen* has retained the cold compresses applied to chest and abdomen, covering them from side to side as much as possible consisting of linen cloth folded four times and slightly wrung out of water of 10°C (50°F.) The applications are to be changed every five to fifteen minutes according to the intensity of the fever. When, however, the patient sleeps quietly, he is not to be disturbed on their account. In the beginning of our observations we were in the habit of making these applications regularly. Later on we omitted the compresses on the chest, which on the whole seemed useless to us. The applications to the abdomen we retained, inasmuch as that seemed very useful and efficacious, using them from the beginning during the whole period of the fever, especially in grave cases. It is important that these applications be changed frequently (sufficiently to keep the surface of the body from becoming warm to the touch) and the nurses have to be watched, so that they execute this part of the method accurately. To protect the bed from moisture, oil-cloth (or flannels) must be laid over the compresses.

*Temperature of the bath.* This varies with a number of circumstances, amongst which the most important is the intensity of the fever and the resistance it offers to the cooling process. There are, however, limits which should not be transgressed. *Brand* mentions 15—20° C. (59—68°F.) as the limits between which the temperature may vary according to the case.

*Brand* correctly rejects the baths of a very low temperature being very unpleasant, and not well borne by the patient. They may perhaps be applicable in the rare cases when the fever resists the baths of higher temperature. As statistics show baths of 15—20° give better results than the colder ones; on the other hand it will not do to go to the other extreme of a too high temperature, inasmuch as statistics have shown that the luke-warm baths do not give very good results. (To humor the patient and his friends, I have generally commenced with a luke-warm bath of 85—90° F., adding no more warm water to the following baths; the temperature will thus after a few baths, come down to the desired degree. In actual practice such yielding will amply repay itself. *Brand* furthermore recommends this method.)

The maximum of the temperature is to be 20° C, with this temperature one ought to begin. The reduction produced is a measure of the

efficiency of the bath, and varies between  $0.2--2^{\circ}\text{C.}$  ( $0.4--4^{\circ}\text{F.}$ ) At times no diminution at all or even an actual increase takes place. In general the reduction ought to amount to  $0.8--1^{\circ}\text{C.}$  (about  $2^{\circ}\text{F.}$ ) if the bath has produced a useful result. In case that the average reduction of the first baths of  $20^{\circ}$  is less, the temperature of the bath must be reduced to  $15^{\circ}$ , in as much as the effect of a bath of  $17^{\circ}$  is hardly better than that of  $20^{\circ}$ . This is the practice which *Brand* recommends.

We also as a rule have followed the same; nevertheless we often have made use of temperatures above  $20^{\circ}$  ( $68^{\circ}\text{F.}$ ) and even as high as  $24^{\circ}$  ( $75^{\circ}\text{F.}$ ). We distinguish, as far as the temperature is concerned, three kinds of baths: one of  $22--24^{\circ}$ , one of  $18--20^{\circ}$ , one of  $14--15^{\circ}$ . (Considering the lack of accuracy of ordinary thermometers for practical purposes we may translate these figures into ( $70--75^{\circ}\text{F.}$ ) — ( $65--70^{\circ}\text{F.}$ ) ( $60--65^{\circ}\text{F.}$ ) which numbers would also be easy to keep in memory.) The first frequently is sufficient in mild cases, in many of medium gravity and in the later stages of the majority of grave cases, to produce the necessary reduction of  $1^{\circ}\text{C.}$  ( $2^{\circ}\text{F.}$ ) In a similar way as the lukewarm bath, gradually cooled down, this kind is adapted to weak and low patients, the adynamic forms and in case heartweakness should be pres-

ent. The bath of 18—20° (65—70° F.) which we ordinarily apply, is applicable in the great majority of grave cases. Nevertheless, during the combat with the fever, when the resistance to the cooling process is very stubborn for a number of days, at least in the evening, baths of 14—15° C. (60—65° F.) have to be employed to produce the reduction of 1° C. (2° F.) To reduce the temperature of the baths, in case the desired result should not be obtained, is a very important rule.

Very high temperatures do not always require equally cold baths. We have seen baths of 22° C. (72° F.) produce reduction of 2—2.5° C. (4—5° F.) where the fever stood at 40.5 (105) and higher. When collapse is threatening, the fall of the temperature may be even more. It is best therefore to experiment a few hours or days, to be able to judge of the resistance by the reduction, which is obtained by the first baths. A safe rule then is to begin with a bath of 24° C. (75° F.) and if the results are not sufficient, to reduce the temperature according to the resistance of the fever to 20° (68°) 18° (65°) and even 15° (59°), until the average reduction of 1° (2° F.) is produced, which is the normal effect of a cool bath.

*Frequency of the baths. Interval between the baths. Baths during the night.* The general



formula demands a bath every three hours, or at least, that one should convince oneself every three hours, that the temperature does not exceed  $39^{\circ}$  ( $102.2^{\circ}$  F.). This rule however does not always hold good. While, as a rule, the effect of the bath lasts from two to three hours, this may not be the case in the beginning of the disease, and in grave cases, when the reduction of temperature may be of but short duration.

The question then arises: are we to bathe oftener, when the temperature rises rapidly after the bath? *Brand* is of the opinion, that the number of the baths should not be increased indefinitely; and that 8 baths in 24 hours are to be the maximum, which ought not to be exceeded. If there should be an early rise of temperature between the two baths, the injurious consequences of this may be nullified by a prolongation of the bath and by a lower temperature of the same, producing thus a deeper and more lasting remission.

We are however of the opinion, that often it is not only useful but unavoidable to bathe oftener than every three hours. In grave cases the single bath can not be given cold enough, nor can it be prolonged sufficiently, partly because the patient, on account of weakness, cannot endure a prolonged cold bath, partly because the attendants cannot make up their minds to



keep him in the cold water long enough. In such cases the insufficient quality of the bath has to be compensated by their number, and every two or one and onehalf hours the same have to be repeated. — We have met such a case in country-practice: 9th or 10th day of sickness, adymania, deep stupor, very high temperatures, it is impossible to keep the patient in his bath longer than 6—8 minutes, and to take the temperature of the water below  $20^{\circ}$ . We therefore had to bathe the patient every one and onehalf hours — later on every two hours. This modification of the treatment produced a good result; after two days the high fever had abated and the stupor was much diminished.

In some grave cases or such of medium gravity it may happen that the reductions about the 15th or 20th day are sufficient or even very pronounced, and that nevertheless the eight daily measurements will show the temperature immovably high,  $39.5^{\circ}$ ,  $40^{\circ}$  and even higher. Here the resistance to the cooling-of-process shows itself in the tendency, rapidly to get back to the apex of the fever curve. This course of the fever can readily be combatted by increasing the number of baths, giving them every two hours, even every hour.

An example for this special form of resistance to the cooling process is the following: A

young typhoid fever patient, who had been bathed since the fifth day, had reached the 18th day of a grave form of the disease. Each measurement showed the temperature to be  $39.5^{\circ}$  ( $103^{\circ}$  F.), and  $40.5^{\circ}$  ( $105^{\circ}$  F.) in the evening, although each bath of  $20^{\circ}$ , and 5—10 minutes duration easily reduced the fever  $1.5$  to  $2^{\circ}$ . ( $3-4^{\circ}$  F.) Taking measurements every 30 minutes showed, that the strong reduction was of short duration, inasmuch as one and onehalf hours after the bath the fever rose to its old height. We now ordered a bath every two hours, upon which the diarrhea decreased and the general condition improved, the temperature but rarely rising above  $39^{\circ}$ , and generally remaining between  $38.5$  and  $39^{\circ}$ , thus allowing the patient to omit the majority of the morning baths during the next day.

To discontinue the bathing during the night under the pretext, not to disturb the rest of the patient by the baths, is not correct, according to Brand; restlessness, sleeplessness, subsultus tendinum, not being sleep. The right kind of rest is that following upon the bath; 12 baths in the course of the day are not sufficient to compensate for the detrimental influences, which an intermission of the baths during the night produces. The aim one ought to have in view, and which is to be reached as soon as possible, is: to keep

the patient night and day in a condition of a relative, a-pyrexia. In the first half of the night or at midnight there often takes place such a high rise of the fever, that all the typhoid-symptoms are apt to recur. Brand adds, that the intermission of the treatment during the night increase the resistance, which the patient will offer to the cooling-off-process during the following day. Finally the night-baths have this advantage: they aid in making more pronounced the decrease in the fever, which is apt to begin spontaneously about midnight. As we have seen ourselves, the greatest thermic remissions are apt to be produced by the morning baths, and the baths, which can be passed over, are generally those between 3 and 9 A. M.

*Duration of the bath.* The general duration of the bath is 15 minutes. It is shorter in the case of children and aged persons. Nevertheless it is not always the watch in hand, which fixes the duration of the bath. No doubt, a cold and short bath of 3—4 minutes duration can produce the stimulating and derivative effect. This however is not the only and (perhaps not) the most important effect of the bath. The anti-pyretic effect only takes place, where the cold water proves itself victorious against that resistance, which the fever opposes to the process of refrigeration. This moment is indicated by the

occurrence of the chill. Even the first immersion into the cold water produces a shivering and chilling of the whole body, this however is not the true chill. This sets in a good deal later, generally 8—12 minutes later. It is more pronounced. The earlier or later beginning of the chill depends undoubtedly on the resistance to the refrigeration, and this again on the temperature of the bath. Therefore it sets in early in the very cold baths of *Jürgensen* and late in the lukewarm baths.

The chill then is as a rule the signal, that the central temperature is beginning to sink. There does exist even a certain relation between the chill and the decrease of the fever, as ascertained 15 minutes after the bath, and the latter is the more marked, the longer the chill lasts. (Glénard.)

There is no doubt, that in many mild cases and in others of medium gravity the cold bath, if interrupted at the beginning of the chill or a few minutes later, will produce a fall of 0.8—1° (about 2° F.) but in grave cases, where the temperature is very high and the resistance very strong, the bath must continue some minutes after the chill has begun. (I think that but for very good reasons it is best to adhere to the 15 minutes of the formula, at least until experience in the individual case has demonstrated a shorter time,

to be sufficient. Vogl's rule is: "an earlier removal from the bath is permitted only, when unusual pallor, or a cyanotic color of the face should show itself, or during marked dyspiasea" conditions, which amongst the thousands of baths have been of rare occurrences.)

*How often are the baths to be repeated?* For Jürgensen 40° (104° F.) furnish the indication for a new bath; for Brand 39°C.(102.2 F.) For this rule Brand gives the following reasons:

(1) Whereas the rule to bathe at 40° is sufficient for the mild cases and those of medium gravity of normal typhoids (80 percent of the cases) this is not the case in the grave and degenerated forms (20 percent). Nearly one half of these cases run their course at a lower temperature, and the very gravity of the case would seem to be the cause, why the temperature remains at a medium height. Inasmuch then, as there are no means of telling, whether the low temperature signifies a mild or a grave form, nothing remains, but to take the temperature low enough for demanding a bath to include the grave cases attended by a low temperature,"

(2) (As far as the number of baths is concerned.) "I (Brand) am of the opinion, that it is not to be forgotten, that the organism to be treated is a human one, and that it should not be taxed more than necessary. The number of



baths *pro die* should be a limited one and should in general not exceed 8 in number. Inasmuch as the effect of a properly executed bath on temperature, pulse, nervous system, the excretion of carbonic acid and urea as a rule lasts  $2\frac{1}{2}$ —3 hours, a bath every 3 hours, in my opinion, is as much as should be demanded from the diseased organism.

(3) According to my theory of the typhoid-fever-process it is the apyrexia which the baths aim to produce. A condition of  $40^{\circ}$  cannot be considered as one free from fever. The highest limit should, in my opinion, be  $39^{\circ}$  ( $102.2^{\circ}$  F.). If at this degree of body-temperature baths are administered, the temperature of the body is for  $\frac{3}{4}$  of the time so near the normal, that one can look at the condition of the patient as one of apyrexia.— If the point for bathing is fixed at  $40^{\circ}$ , it will be found upon inspecting the average daily temperature-curve, that the same, instead of steadily sinking and finally remaining between  $38$  and  $39^{\circ}$  ( $100.5$ — $102.2^{\circ}$  F.) will always stay above the latter figure and have a tendency to rise above  $40^{\circ}$  ( $104^{\circ}$  F.) and will often go beyond this figure. Such a behavior of the temperature will not furnish the necessary protection against the dangers of the typhoid-fever-process.” So far *Brand*.

“The limit of  $39^{\circ}$  however is not irrevocable or axiomatic. During the period of defervescence



it may happen that even at the evening exacerbations the temperature does not reach  $39^{\circ}$ . In such case it is well to give 1—2 baths at night of  $22\text{--}24^{\circ}$  ( $70\text{--}75^{\circ}$  F. about), to procure a good nights rest and to hurry on the defervescence and to insure reconvalescence. Finally it is well in grave cases particularly, when during the period of defervescence the curve of the averages of the maximum has assumed the wave-like type, to take  $38.5^{\circ}$  ( $101.7^{\circ}$  F.) as the indication for a new bath in order to avoid a recrudescence of the fever.

*Thermometrical measurements.* For a methodical execution of the cold-water-treatment of typhoid fever thermometrical measurements are necessary, if not desirable. As a rule 16 such measurements are necessary, 8 before and 8 after the bath. (In private praxis 2—3 measurements per day after the bath seem sufficient to me. S.) In some particularly grave cases, when e. g. it is necessary to bathe the patient every two or one and one half hours, or when it is desirable to be informed concerning the course of the fever in the intervals of the baths, the temperature has to be taken every  $\frac{1}{2}$ —1 hour. Towards the end of the treatment such frequent measurements are unnecessary, one in the morning and one at night being sufficient. It is indifferent which hours are chosen for taking the temperature, we advise however the fol-

lowing: 12 o'clock midnight, 3, 6, 9 o'clock A. M., 12 o'clock noon, 3, 6, 9 P. M. — How long after the bath ought the temperature to be taken to judge of the efficiency of the bath? Without doubt at the time of the deepest descent. This moment however varies according to different circumstances. As a rule the mercury will be falling for 20—30 minutes after the bath; after this time the chill generally will have ceased and the patient sleeps. It would certainly be harmful for the patient to keep back or interrupt this sleep, even for the purpose of a necessary measurement. It is therefore best to take the temperature 15 minutes after the bath. It is important to use with the same patient always the same interval to make comparisons more perfect.

The attendants keep a record of measurements, so that the physician can get an insight into the course of the disease, the effect of the treatment and the thoroughness, with which this has been carried on during his absence.

The frequency of the thermometric measurements has been criticised, and has been used as an argument against the *Brand* method. Experience however teaches, that in hospital and private practice such measurements can be carried out as often as required. In case the use of the thermometer should be absolutely impos-

sible, the height of the fever can be reasonably determined by certain other signs, a red face, dry tongue, thirst, head-ache and sleeplessness, grave nervous affections. The red cheek is of considerable value, (indicating often an exacerbation). As long as the temperature is below  $39^{\circ}$  the color of the face generally is normal, if it rises however over  $39^{\circ}$ , and remains there some time, one or both of the cheeks are apt to be covered by dark-red color. Aside from the gravity of the symptoms, the measurements, which the physician himself makes during his visit and the result of a 1—2 days water-treatment will allow a judgement to be formed on the intensity of the fever. We know from having treated numerous patients after *Brand* that we have a grave case under our care, if after having been bathed continuously, the patient at the end of the first or the beginning of the second week, will not pass over a bath and must have his bath every three hours, while in milder forms of the disease or near the end of the illness he will be much more apt to omit some of the baths. We know further that the first baths that can be omitted are generally the morning baths (3—9 A. M.). According to this condition a physician in the country can use the method without exact thermometric measurements. Nor is it necessary to take the temper-

ature of the water with an instrument, it can be estimated by means of the hand. (I cannot imagine that a physician any where will have any trouble to have his fever- or bath-thermometers used intelligently by his patient. There are a good many broken of the former, but as they are now comparatively cheap, this is no longer such an important matter.) The measurements in the rectum are much to be preferred to those in the axilla; they are much more accurate, 3—5 minutes are sufficient.

Of course it is important that the physician should control the work of the attendants by taking the temperature himself (or having it taken during his presence) once a day. The thermometer should be dipped in some lard etc. every time before being introduced.

*Cessation of the baths.* In general the bathing can be stopped, when the temperature at no time of the day reaches  $39^{\circ}$ . ( $102.2^{\circ}$  F.) The cases which have been treated methodically are now in the period of defervescence and relapses are not much to be feared. Especially in cases of medium gravity it is to be recommended to continue the use of the bath even if the temperature of  $39^{\circ}$  is not reached any more. Thus a bath of  $22\text{--}24^{\circ}$  ( $71\text{--}76^{\circ}$  F.) of 5—6 minutes duration can be given every time the temperature rises to  $38.5^{\circ}$  ( $101.7^{\circ}$  F.) especially if the fever rises

rapidly after the bath. Quinine is often of use in this later period. Still later 1—2 baths look-warm or cool towards evening are useful.” — So far *T. & B.*

There are, besides the cool bath, two other methods, which ought to be mentioned as being useful under certain conditions: (1) the luke-warm half-bath with cold affusions, which was the method originally employed by *Brand* and (2) the method of *Ziemssen*.

*The cold affusions in the luke-warm bath* are executed thus: There are to be 5—6 inches of water of about 85° F. in the bath-tub, 2 or 3 pails of cold water, of 50—65° F. are standing ready at hand. The patient is supported in a sitting position in the bath, and moistened and rubbed with the water in the tub. Next the water in the pails is poured with a pitcher, sprinkling can etc. over the patient in such a way that it will run over his occiput and back; it ought not to be poured from any considerable height. After 2—3 minutes the procedure is repeated, the patient being rubbed down thoroughly all the time. The whole procedure is to last from 3—10 minutes. — This form of the bath has more of the stimulating than the cooling properties and is therefore applicable in cases where the reduction of the fever is easily accomplished and other symptoms demand the use



of the water, as in cases with normal temperature, or moderate fever, the “degenerated” and complicated cases that come under treatment in a late stage of the disease.

*Ziemssen's method.* Here the patient is placed in a lukewarm bath, about  $5-6^{\circ}\text{C}$  ( $95^{\circ}\text{F.}$ ) below the temperature of the body, the bath lasts about 20—30 minutes and the temperature at the end of the bath is to be  $20^{\circ}$  ( $68^{\circ}\text{F.}$ ). Cold water is to be added to the original bath until the lower temperature which may be desired is obtained. A bath of this kind must last 30 minutes to produce the same effect as the ordinary bath of the formula, and in grave cases it does not seem to be as efficient as this. This bath has its use in the treatment of elderly persons, of very weak persons, in a late stage before more active measures can be used, in heart and lung complications, and as an excuse for something better. But statistics do not show as good a result from its use than from that of the classical bath.

Both of these methods suffer from the drawback, that hot water has to be used. While for 1—2 baths a day this may not be of much consequence, for a large number of baths this would be the case to such a degree, to become a serious hindrance to an extensive introduction of the method in private practice,—on account the labor, of the noise and turmoil, which the carrying



to and fro of the water, the pouring and heating of the same will make necessary.

#### EXECUTION OF THE METHOD IN SPECIAL TYPES AND CONDITIONS OF THE DISEASE.

*Grave cases and cases of medium gravity.*  
As might be expected from the second chapter that period, during which the combat with the fever is in progress, is of the highest interest in the grave cases and those of médium gravity. On the more or less thorough way in which this battle is carried out the further course of the fever, the presence or absence of complications and even the final outcome will depend. — The truly hyperthermic forms, which furnish the greatest resistance to the water-treatment are the very ones where one must not follow the letter but the spirit of the method. The desired end will often not be reached by the formula. After 8, 10 or 15 days the temperature will of course go down, but this is too late for the organism, which is exposed to a high, permanent and insufficiently combated febrile condition.

If from the first days of the treatment the temperature-maxima (before the bath) are all  $40^{\circ}$  ( $104^{\circ}$  F.) or more in the morning and reach and exceed  $41^{\circ}$  ( $105.8^{\circ}$  F.) in the evening, the resistance to the refrigeration is of a high degree and the condition is critical. Under such con-

ditions the general formula will produce but a very moderate fall of temperature or none at all nor would  $0.8 - 1.0^{\circ}$  C (about  $2^{\circ}$  F.) seem sufficient. The main point is to prevent the recurrence and the continuance of the high temperature. For this purpose one begins with a temperature of  $15^{\circ}$  C. ( $59^{\circ}$  F.) for all baths between noon and midnight. If this is not sufficient, all the 8 baths on the following day are given at  $15^{\circ}$ . In case the fever does not yield, the duration of the bath is extended to 18—20 minutes. In extreme cases we advise the cold pack of 1, 2 or 3 quarter hours duration, to be changed every 10 minutes, to precede the bath. We have thus succeeded in obtaining a reduction of temperature, which it was impossible to obtain by cold and prolonged baths.

At times the resistance against the reduction of temperature assumes a peculiar form. The reductions are sufficient and even great, but the temperature rises at once after the bath, a peculiarity more apt to occur in a late stage of the disease. In case we suspect this condition, we take the temperature every  $\frac{1}{2}$  hour between the baths, which may reveal that the temperature has reached its former height 1 — 2 hours after each bath. This furnishes the indication to repeat the baths every 2 or  $1\frac{1}{2}$  hours, so that the patient may receive 12 — 14 baths in 24 hours.

After 2—3 days of such an energetic but necessary battle the fever-curve no longer retains the ascending direction, the danger of an excessive hyperpyrexia has disappeared, so that less vigorous procedures and even the general formula may be employed. If typhoid fever-cases succumb, in spite of an early (from the 4th or 5th day on) application of the method, we cannot help to suspect that the battle with the fever has not been conducted from the beginning with the necessary severity. These very cold and very prolonged baths, these prolonged cold packs are, it is true, very unpleasant, but are born better than one would at first be inclined to believe. The higher the fever and the more resistance it offers the less is the danger of excessive refrigeration. Furthermore the period of the battle with the fever — if correctly conducted — rarely lasts longer than 3—5 days.

In certain grave cases the period of relative apyrexia may be of very long duration. The curve will describe an undulation of 4—6—8 days duration, so that one may be inclined to look upon them as a series of infections or relapses. Such patients require a great number of baths (140—200). It is however of special importance, that they be kept within the bounds of relative apyrexia, in as much as the fever-cycle

is a long one having the dangers of hyperpyrexia in its wake. One cannot be too accurate in strictly carrying out the method, especially in the first part of this period i. e. in the first 10—15 days of relative apyrexia, because then an irregular and insufficient treatment may be followed by serious consequences. Equally good must be the nutrition of the patient. “Feed and cool off”—this precept is particularly valid for these tedious and grave cases. One must try to undo the harm, which each day of febrile consumption brings about. The allowance of wine may be increased to 800 grms. (about  $1\frac{1}{2}$  pint) after each bath, night and day, the patient must take nourishment of the quality fitting the stage of the fever. Thanks to the happy effect of the bath on the digestive functions, it is possible to nourish the patient and notwithstanding the long duration of the fever, the patient will reconvalesce as certainly and rapidly as in less grave forms.

At the time of the decline of the fever the baths should not always be omitted even if the fever does not reach  $39^{\circ}$  C. ( $102.2^{\circ}$  F.) any further. In case the condition of the patient is not a good one and nervous disturbances (e. g. in cases that come under the bath-treatment late) are present it is well to continue the baths at  $38.5^{\circ}$  ( $101.7^{\circ}$  F.). These may be of shorter

duration than in the beginning. We have seen already that at the time of defervescence short baths produce the same reduction as long ones [at an earlier period.]

*Mild forms.* The general formula is here always sufficient. A mild case cannot be recognized as such in the first days. The first baths produce a more or less rapid but persistent movement towards defervescence.

On the second or even first day baths can be omitted. As in the cases of medium gravity the period of the decline of the fever is a delicate one ; the baths must not be omitted too early. Just in such forms recrudescences and relapses are want to take place. They can be avoided if baths are given even if the temperature does not exceed 38. 5°.

*Afebrile and hypo-thermic forms.* The hypo-thermic forms in overworked and run-down individuals are apt to take on an adynamic form. Even in connection with low temperatures the function of the brain may be seriously disturbed ; all the complications of typhoid fever can be observed in such cases, especially lung-complications. These cases are grave, their mortality high. It is unnecessary to remark that the first indication is, not to use of antipyretic measures, but to overcome the initial complication, the general prostration. It is necessary to furnish



to the body in some way the power to produce fever. For this purpose neither the formula of Brand, nor the cold bath of Jürgensen, nor the lukewarm bath of Ziemssen is adopted, but alone the half-bath of  $27^{\circ}$  (80 F.) of 3—5 minutes duration, with affusions of  $20$ — $12^{\circ}$ , (68—54 F.), gradually diminished combined with thorough rubbing. Such a bath repeated 4—6 times a day, together with compresses, good nourishment, strong wine and fresh air will meet the indications. Strube also, who in the afebrile typhoid has operated with various hy-driatic procedures praises the efficacy of the half bath. After a few days merely of this treatment fever makes its appearance, “so that the abnormal is connected into a normal form of the disease, with the prognosis peculiar to the same.” (Brand) According to the indications furnished by the high degree of adynamia on the one hand and the intensity of the fever on the other hand either the half-bath with affusions or the general formula of Brand is employed.

*The typhoid fever of children.* “As a general rule one may, in the case of children begin with the general formula. The duration of the baths however is to be shorter; a bath of 5—8 minutes duration is sufficient in the majority of cases. If a prolongation beyond 10 minutes is avoided, there are no accidents to be feared.

The resistance of the fever is not so great in children. The chill makes its appearance earlier. It is rarely necessary to carry on the battle with the fever very energetically and for any longer period. The child will cry, scream and resist and force has to be used to keep it in the bath.

One may try to deceive it by using at first lukewarm baths, and further on cooler and cooler ones."

*Brand* says on the treatment of children: "I add the practical hint, that children prefer even more than grown persons the colder and short bath to the warmer and long one and that they bear well even a bath of  $12-15^{\circ}$  C. ( $54-59^{\circ}$  F.). It is therefore not acting according to their wish if high temperatures are chosen. An altogether bad practice however it is, (which I am sorry to say, is often followed) to use baths of a higher temperature and shorter duration. In such baths also the children are refractory and in as much as the baths are useless, the little ones are tormented without being benefited. *The child must be kept as free from fever as the grown person.*"

*The typhoid fever of old people.* "*Brand* does not look upon advanced age as a contraindication. He is of the opinion, that up to 50 years the general formula, as a rule, may be ad-

hered to. Beyond this period the *Ziemssen* bath is to be preferred. *Brand's* results are very good; out of 11 persons of this class thus treated all recovered. (8 between 40 and 50, 1 between 50 and 60, 2 between 60 and 70). (*T. & B.*)

*Pregnancy and menstruation*, *Brand* says, are no contra-indications to the hydriatic treatment.

“*Obesity* which for medicinal treatment is a dangerous complication, is not so for hydriatic treatment. I have carried through a severe attack of typhoid fever a Hebrew woman weighing 100 kgr. (about 200 lb.) and an excellent colleague weighing 120 kgr. (about 240 lb.) without any difficulty. The anasarca which is apt to develop in fat people is of no consequence and disappears itself in the period of convalescence.” (*Brand.*)

“*Organic heart disease.* For medicinal treatment this complication is considered particularly unfortunate. Of 6 cases treated with medicines 3 died (in Basle) while of 3 treated with water all recovered.” *Brand.*

*Sweating.* Excessive sweating in the first week of the illness is a symptom making the prognosis unfavorable. It is however no impediment to bathing. The sweating which occurs later and which is of a critical nature is of a different nature and significance and a sign that

the stringency of the treatment may be relaxed during its presence bath may be omitted.

THE TREATMENT OF COMPLICATIONS AND OF  
CASES THAT CAME UNDER TREATMENT LATE,  
AFTER TRIPIER AND BOUVERET.

“*Typhoid fever cases that come under treatment in a late stage of the disease.* It is to be regretted that cases of typhoid fever, in which the pathological process can be combated from the beginning, are not in the majority. Especially in hospitals the cases are admitted after the 8—12 day of the disease has passed, when they are but rarely free from complications. They are then, to use a phrase of *Brand*, degenerated, and grave affections of the brain, the thoracic or abdominal organs are usually present. We shall later on discuss the means of treating these complications more fully ; it is however necessary to give a few general rules for the treatment of typhoid fever in a later period.

What has to be taken into account in the first place is the condition of the patient's strength and particularly of the power of the heart. If the 15. or even the 20. day has passed, and the pulse is neither feeble nor frequent the ordinary formula can safely be employed. We have obtained good results in these

on the whole unfavorable cases. What has to be avoided are long baths ; cooler baths 22—18° C- (72—65 F.) of only 5—8 minutes duration are to be preferred, which however must be repeated, if the fever demands it every 2 hours or even every 1½ hours. More important, under the present circumstances, than any where else, it is, to individualize with the water treatment and to direct the treatment in accordance to the results obtained by the first baths.

In case of pronounced heart-weakness with feeble and frequent pulse and the signs of hypostatic congestion of the lungs, the shock of the cold water is to be avoided, which the heart, enfeebled by the long continued fever, does not bear well, and in place of the cold bath, the luke-warm or gradually cooled-down bath to be substituted, and at the same time, and with the aid of alcohol, wine, champagne, and a suitable diet, the adynamia is to be combated, which increasing from day to day is the principle danger for these neglected cases. In case that the luke-warm baths for any reason cannot be given, ablutions are to be used which may be of a good deal of benefit. Cold enemata however are to be avoided. On account of deep and exclusive ulcerations of the intestines, which generally are present in such cases, that have been allowed to take their natural course, the cold enemata whose



usefulness is problematical, may be dangerous byproducing repeated contractions of the intestines.

Take it all in all the use of the baths must not be discarded. The hydriatic treatment is still better than anything else that could be advised, but requires more care more attention, more patience, more supervision than in the beginning of the sickness. In the beginning of the sickness the patient might bathe himself, without any physician to advise him, and any nurse to watch him ; for which we have proof, having seen it done during an epidemic in a village. But in an advanced stage the use of the hydriatic method is something surrounded with difficulties and requiring tact and judgment. Yet even so it is a powerful weapon which in skilful hands may bring about unhopd for results.

In the Lyon Medical—Nos. 16, 17, 18, (1891) *Bouveret* has published an article in which he reports on 100 cases of typhoid fever treated in the Hôtel Dieu in the course of two years, according to *Brand's* method. The mortality was 3 per cent. It will be recalled that the results obtained by him in the Hôspital de la Croix Rousse were 7. 3 per cent, and it was prophesied that in the Hôspital Dieu his percentage of recoveries would not be so favorable, the hygienic-

condition of the Hopital de la Croix Rousse accounting for the favorable results obtained there. Instead of an increase in the rate of mortality, we find a decrease of over 50 per cent. These remarks however only incidentally. I find in this article some interesting paragraphs illustrating the foregoing remarks, and shall insert them here.

“A number of my typhoid fever cases, treated by baths, were in a very precarious condition at the time of their admission, so that they almost had the appearance of hopeless cases. Four young women admitted on the 10th—15th day and all suffering from a severe form of the disease, presented very alarming signs of heart-weakness. The pulse of very feeble character exceeded 150 per minute, and in two of the cases it remained between 160 and 170 for several days. The beats of the heart presented alternately the foetal rhythm and the bruit de galop. The bronchial catarrh was intense and was already accompanied by hypostatic congestion of the lungs. I fear this weak condition of the heart far more than delirium and the symptoms of cerebral excitement in the first days of the invasion.

Without doubt the acceleration of the pulse is a grave prognostic symptom. Nevertheless, I believe, I can support the statement, that in young persons and particularly in young women

neither the foetal rythm, nor a rate of 160—170 are, as has been said, certain signs of a fatal termination. These four cases of typhoid fever were bathed and recovered, although they presented for several days these two signs of heart-weakness.

I am in the habit of paying particular attention to the treatment of such cases. If a case of typhoid fever of such a grave character arrives in an advanced stage of the disease, I begin with lukewarm baths,  $26^{\circ}$  —  $28^{\circ}$  and even  $30^{\circ}$  (79, 83, 86 F.) and determine the temperature and the duration of the following baths by the resistance which the organism offers to the refrigeration. If these lukewarm baths produce an abatement of the temperature of one degree C. (2 F.) I have them continued. If the reduction of the temperature is very feeble or even replaced — which is very rare in this class of cases — by an elevation of temperature after the baths, I lower the temperature of the water to  $26^{\circ}$ ,  $24^{\circ}$ ,  $22^{\circ}$  and even  $20^{\circ}$  (79, 75, 81, 68 F.) This is the way in which I proceeded with my four patients. One of them continued to take baths of  $26^{\circ}$ — $28^{\circ}$  (79—83F.) which were sufficient to combat the fever efficiently, this being reduced on the 12th or 13th day of treatment. The other three took baths of  $20^{\circ}$  (68 F.). I have observed neither faint-

ing spells nor attacks of syncope in the bath and I attribute the result to this rule of my practice: in the grave cases with signs of heart-weakness not to administer at once the real cold baths, to explore with the luke-warm or moderately cool bath the power of the patient to resist the systematic process of refrigeration.

The immersion is only a part of the treatment. I have each bath preceeded by a thorough friction of the whole body, (excepting the abdomen) energetic enough to produce a lively rubefaction of the skin. These repeated excitations always seemed to me to act favorably on the heat regulation during the duration of a cool bath. I have them take in 24 hours  $2\frac{1}{2}$  to 3 litres ( $2\frac{1}{2}$ —3 qts nearly) of milk, one bottle of old wine, 50—100 grms. (2—3 ounces, nearly) of rum and in some very grave cases I have added champagne and infusion of coffee. And I assure myself repeatedly that my directions are carefully carried out. These cases are under my own direction where I have a corps of nurses so excellent, so zealous, so well posted in the method of the cool-bath-treatment that it gives me pleasure to acknowledge this.

The heart of these grave typhoid-fever-cases remains very excitable into an advanced period of convalescence. On the tenth day of deferescence the pulse of my four cases was 120

even when resting, and upon any excitement it went up to 140 and beyond that. It is necessary to prescribe to these reconvalescents complete rest of the body and mind, in bed, until their strength has sufficiently recovered and their heart no more presents this dangerous excitability. It is the best means to avoid a fatal syncope." So far from the Lyon Medical.

Let us take a grave case, having reached the end of the second week, with continuous delirium, a temperature of over  $40.5^{\circ}$ , hypostatic congestions of both lungs impending, with abundant diarrhoea and some signs of heart weakness. The patient has been treated with many more or less efficient remedies. The delirium had required musk, bromide of potassium or camphor; the fever some antipyretic remedies, quinine, antipyrine, antifebrine; the congestion in the lungs at least kermes or ipecac; the diarrhoea bismuth; the heart-weakness digitalis etc. What a superiority has not the water treatment over all these medicines! It knows of but one remedy, cold water, and to meet the majority of the indications properly, it is only necessary to select from the numerous procedures at its command, the one which seems the best adapted.

*Nervous symptoms.* — The minor nervous symptoms which we find in various degrees in all cases of typhoid fever. the headache, the



sleeplessness, the languor, the tinnitus, the dizziness will be removed or ameliorated by the baths, whose number and degree will be fixed by the height and general course of the fever.

We intend to speak here about the more grave nervous affections, the delirium, the ataxia, the restlessness, the stupor and the coma. These depend perhaps more directly than the others on the hyperpyrexia, for they generally are the first to disappear in cases that have been treated perfectly. The first indication then in their presence is to combat the fever and to modify the general formula in such a way as to produce as quickly as possible a reduction of the temperature. *Brand* recommends to pour very cold water on the head and to continue the bath until the heat and the redness of the face have disappeared and to cover the head in the intervals with cold compresses to be changed repeatedly or with an ice-bag.

In the atactic forms with early delirium and great restlessness the indication is to reduce the generally very high temperature still more. The fever must be combatted energetically with cold water; if the hyperpyrexia demands it one must not hesitate to use baths of 15° (59 F.) of 15—20 minutes duration for one need not fear in these conditions to see as has been said, that under the influence of the cooling process the excitation will

be followed by a stage of depression. The patient, who often is under the influence of a furious delirium has to be kept down in the bath by main force, long enough, in spite his restlessness to obtain the average reduction of  $0.8-1.0^{\circ}$ . The patient must further be protected against bumping himself too frequently against the sides of the tub. A delirious case of unusual severity was covered towards the end of the treatment, over his whole body with contusions, which changed into small abscesses ..... The combat against this furious delirium may last for days. In the case mentioned, the delirium did not disappear before the third day of treatment. The patient being unconscious one is not obliged to take his sensations in account. A patient of Glénard was not conscious of being treated with cold baths until he had his 32. one. He recovered.

In case that the ataxia is complicated by convulsions every irritation of the nervous system ought to be avoided. The conditions are different from those of epilepsy. *Brand* advises to discontinue the process in the presence of the convulsive attack, to combat the excessive heat by ablutions and cold compresses, but to go back to the baths in the intervals. One must keep in mind that it is not the stimulating but the antipyretic effect of the water which here is

desired and hence the luke-warm full bath with affusions is to be preferred to the cold full bath.

In case that delirium and ataxia have existed a *long time* or have appeared in a *later stage* of the disease *matters are different* (italics by S.) and it is generally advisable not to proceed with the same severity as in the early delirium. *Brand* recommends baths of 22—25° (72—77F.) but of longer duration 15—20 minutes together with a slow and moderate affusion of the head to avoid the sudden impression of the cold water. In case an adynamic condition is accompanied by delirium, or a frequent and small pulse indicates heart-weakness, the luke-warm, or the gradually cooled down bath is to be recommended.

In case deep stupor is the prominent symptom, the treatment has to be antipyretic and stimulating. *Brand* mentions that in such cases *Jürgensen's* method may be of good effect: full baths of 10—20°, (50—68F.) 5—10 minutes duration, but prefers the half bath of 25° (77 F.) with short but very cold affusions accompanied by thorough rubbing. The method of *Jürgensen* can only be employed in hospitals. The half bath with cold affusions seems preferable to us, because it can be used also in the later stages of the disease. In case the patient is in a pronounced comatose condition the condition is

far more dangerous. The paralytic condition of the brain is generally accompanied by a weak condition of the heart. The patient is not influenced by any stimulating agencies, the pupils are wide, little influenced by light and the pulse is weak, over 150—160 per min.; collapse is impending. We have seen in such cases baths according to the formula being followed by considerable and dangerous reductions. In such cases one must act with the view to stimulate and cool off at the same time. A very short cold bath, or a short affusion, a lukewarm half-bath with cold pack and frictions of the whole body, with exception of the abdomen are here to be preferred. *Winternitz* who is of the opinion that the hyperpyrexia and the retention of the fever-heat is at the bottom of the grave symptoms highly recommends these energetic and prolonged stimulating procedures to the skin. In many such grave cases one is successful in removing the coma; the patient regains consciousness; unhappily however the heart-weakness persists, leading to broncho-pneumonic complications to which the patient succumbs.

*Thoracic symptoms and complications.* In case the initial bronchitis is of a high degree the ordinary formula can be employed at once. It is not necessary to diminish the shock of the cold water. The sudden impression of the low tem-

perature produces cough and expectorations, stimulates the circulation in the lungs and prevents the formation of hypostatic processes. *Brand* mentions the method of *von Gietl* in Munich, who for years has employed cold affusions in the lukewarm halfbath against this intense bronchial catarrh of typhoid fever. Besides this he recommends, to relieve the pain, cold compresses to the chest repeatedly to be changed. Patients however do not bear well this continued application of cold to the chest. The baths always have seemed sufficient to us to bring about improvement of the initial bronchial catarrh.

Cough at times is very violent and accompanied by thoracic pains. The former grows less as soon as the temperature begins to sink. Should that not be the case a mixture of alcohol and opium to be taken before or after the bath can be recommended.

One not accustomed to the method who sees a severe bronchitis develop in the first days of the treatment, and to persist, is very apt to diminish the number of the baths, and to increase their temperature or to discontinue them altogether. This is a mistake which must be avoided for in the grave cases the cessation of the bathing is followed at once by a rise of the temperature to the former height together with



a reappearance of the grave symptoms and an aggravation of the bronchial catarrh. The latter often is followed later on by hypostatic pneumonia and broncho - pneumonia. Medicines (Ipecac) ordinarily useful in such conditions are here without avail, and have besides the drawback to increase the tendency to adynamia. The treatment must be continued fearlessly and systematically; experience will demonstrate in a few days, that the bronchitis will diminish in intensity.

As far as the hypostatic and bronchopneumonic process of a *later period* of the disease are concerned the best means to prevent them is an early and vigorous application of the method especially when an initial bronchial catarrh of any degree of intensity should be present. As a rule however these complications, we are sorry to say, are fully developed. In case that the pulse is not frequent and especially if we have not to do with a case that comes under treatment in a late stage the ordinary formula can be employed. We have often seen hypostatic congestion disappear after a number of baths have been given. — In case however the heart has become enfeebled (high puls-rate) if we have to do with a case that has not been bathed in the first period of the disease, we prefer to use the luke-warm or the Ziemssen bath and extend its duration.

The treatment must however be carried out regularly a bath when the temperature reaches 39° (102.2 F.) the temperature to be taken every 3 hours. — Wine and alcholic liquors are indicated to sustain the flagging heart-energy and to combat the tendency to adynamia which almost always is present in these complicated cases of typhoid fever.....

The initial lobar pneumonia does not demand a modification of the treatment, but rather demands it two-fold. The elevation of temperature is the chief point of attack for the treatment. The ordinary formula can be used and in case the fever is very high baths of a lower temperature and in more rapid succession can be administered, just as if we had to do merely with a grave case, not complicated by an intercurrent pneumonia (see the treatment of the grave forms). — In case that the pneumonia appears in the course of fever, the cold baths still give good results (See Chapter IV, case V.) and the excessive hyperpyrexia, always foreboding danger, always requires, as long as heartweakness is not pronounced an antipyretic process which can only be brought about by means of the cold baths or by a prolonged cold pack. To meet thus the indication of reducing the hyperpyrexia, and at the same time taking account of the feeble heart, the lukewarm or gradually cooled

down bath with cold affusions to the head is to be preferred.

With some patients pain in the chest makes the baths very unpleasant. We have seen that in one case complicated by a lobar pneumonia the excessive pleuritic pains made the abandoning of the baths necessary. In such cases Brand insists on the application of cold compresses to the chest for the purpose of removing the thoracic pain and the pleuritic stitch. We do not make use of them, because they are uncomfortable to the patient and a source of inconvenience. If the pains continue, we prefer a hypodermic injection of morphine. In general we do not employ these much in typhoid fever, having seen the punctures form the starting points of abscesses.

*Disturbances of the circulation.* During the whole course of the fever the careful auscultation of the heart ought not to be neglected, inasmuch as the treatment and the prognosis depends a good deal on the condition of this organ.

Some patients have a great tendency to fainting spells either in the bath or in the intervals between the baths. These frequently are of a transient character disappearing at the same time that the patient accustoms himself to the cold water and that the latter exerts its beneficial

influence on the fever. The simplest remedy against this unpleasant symptom is to administer a liberal dose of alcohol, rum, brandy in sugar-water, old wine, champagne, or a mixture of alcohol and opium mentioned above. It is useful to sprinkle head and chest of the patient with very cold water to mitigate the shock which the patient experiences on being immersed in the bath. If these means are of no avail and if the syncope returns with each bath it may be necessary to replace for a time or definitely the cold bath by luke-warm or gradually cooled down baths.

In case of collapse Brand recommends not to discontinue the baths. To proceed with the baths is according to him, the best means to prevent its return. In case the shock of the cold water is not well born, the gradually cooled down bath can be made use of to combat the fever. In case that collapse appears during convalescence it must be treated with diffusible stimulants, warm drinks and alcohol. This is the practice of Brand.

The shock of the cold water setting in suddenly in the stage of fever may itself be of some use. The short cold bath, the cold affusions, the luke-warm half bath with cold affusions combined with rubbing of the skin and massage of the extremities, these are the procedures appli-

cable in such conditions. As a rule the collapse is only transient, the fever returns and the ordinary line of treatment can again be taken up. To prevent its return, the dose of wine or alcohol must be increased. In the interval between the baths we order the chest and the limbs thoroughly to be rubbed two to three times, four to five minutes with a piece of flannel saturated with eau de cologne or essence of turpentine. The same procedure we advise in cases where a very frequent and small pulse indicates a feeble condition of the heart. The last resort are subcutaneous injections of ether. According to the condition every one to two hours or more frequently a Pravaz' syringe full of ether is injected, preferably into the upper extremities. These injections, however, have the drawback, that at times they produce extensive abscesses, a drawback, which cannot be taken account of considering the far greater danger from the collapse.

It may happen that in spite of all these measures the collapse continues. The only thing that is left to revive the deficient activity of the heart, is to envelop the whole body with the exception of the head into flannel (blanket) saturated with hot water, and to thoroughly apply friction to limbs and chest, omitting the abdomen, the cloth of course remaining between hands and the body



surface. This process is to be repeated every 10 minutes. While the patient is thus rubbed and his body heat restored, he repeatedly takes some strong wine or hot punch.

Syncope demands the same mode of treatment. If—what rarely happens—it takes place during the bath, the patient is taken out of the bath and placed with the head as low as possible on a mattress or a bed and all the remedies suitable to bring back and stimulate the activity of the heart are to be employed. Such are whipping the face, blowing upon the cornea, titillation of the nostrils, faradization of the region of the heart, energetic friction of the whole body etc. When the patient has regained consciousness he is warmed with hot drinks, hot cloths, and hot jugs of water. The same remedies can be used in cases of syncope occurring between the baths or during convalescence. Unhappily they often are of no avail.

Permanent weakness is a frequent and dangerous accompaniment of all cases of typhoid fever that come under treatment late in the disease. The pulse is very frequent and very weak, the face and the extremities are cyanotic, the peripheral temperature sinks lower and lower, while the central remains high. One need not at once discard the use of the water in such cases; often the abstraction of heat alone

makes these bad symptoms disappear in the course of a few days. If the contrary takes place, if the symptoms grow worse after the first baths, the luke-warm or gradual cooled down bath finds its proper place. It is however necessary to bathe regularly. Often if the central temperature is very high, it is useful to give the baths close together, every two hours. The patient must have day for day large doses of alcohol. Digitalis we consider useless and even dangerous. Between the baths we often apply the packing and rubbing as described under the head of collapse.

*Intestinal hemorrhage.* We have in a previous chapter distinguished between two kinds of hemorrhages: an *early*, false, and a *late*, true, hemorrhage.

The early hemorrhage does not require the cessation of the baths. These even may exert a favorable influence on the hyperamia of the intestinal mucous membrane, which in all probability is at the bottom of these early hemorrhages. In a case of *Raynaud's* the loss of blood was controlled by a bath, after all other remedies had proved ineffectual. Undoubtedly this was a case of congestive hemorrhage. The local application of cold to the abdomen is very useful while medicines are without effect.

The late hemorrhage demands a temporary and often a permanent discontinuation of the baths, but not only of the baths, but also of the enemata, because the energetic injection of the cold water into the colon excites also contractions of the small intestines and interferes thus with the arrest of the hemorrhage. For the same reason abstension from eating and drinking, as far as possible, is indicated. The intense thirst which is apt to accompany the profuse hemorrhage must be quenched with small pieces of ice. Only very small quantities of milk or broth cooled with ice are to be permitted. The external application of cold can best be accomplished by a large icebag to the abdomen fastened to a hoop fixed on to the bedstead preventing the same from slipping. Ergotin in a mixture or per injection has been recommended. But this remedy has not seemed very efficacious to us. That injections easily lead to the formation of abscesses has been mentioned. The styptic remedies, tannin, plumb. acet., liq. ferri sesquichlor. have a very doubtful effect; it is better not to employ them. Opium in large doses is reserved for peritonitis and intestinal perforation.

In case that the hemorrhage is of a dangerous character from the beginning, there remains as a last resort the transfusion of blood. This was performed with success in such a case

by *Gibert* in Havre. His patient had lost 1500 grms. of blood at one time so that death seemed imminent. *Gibert* made two injections on two consecutive days, 30 grms. the first and 60 grms. the second day. The patient recovered. In case blood is not at hand, nor a transfusion apparatus intravenous saline injections must be sufficient with a simple and readily prepared apparatus of the form of a syphon, this small operation can readily be executed (L. Bouveret, Intravenous saline injections in the treatment of cholera) *Schwarz* has advised a saline solution simple and everywhere preparable.

Water 1000,0

Salt 5,0

Soda a few centigramm.

This solution has repeatedly been used with success in cases of anaemia produced by profuse hemorrhages. This seems to show that this or a similar fluid is able to take the place of the transfusion of blood.

In case the threatening danger has passed by, the hemorrhage has ceased, the collapse been recovered from, the strength of the patient must carefully be built up, so that the former line of treatment may be taken up again. The hemorrhage is followed by a constipation lasting several days. Not before three to four days anything

should be done against this condition with cold-water-enemata.

In case that the hemorrhage was not very severe, and the patient was near the time of defervescence, and in the absence of any dangerous symptoms the cold baths can be omitted; cold compresses or ice-bags to the abdomen are sufficient. Experience teaches that as a rule such patients make a rapid recovery.

Matters are different if the hemorrhage when profuse takes place in an adynamic case who has come under the bath treatment late. The hemorrhage here generally proves fatal. In case the fever continues high an attempt can be made to go back to the baths, after the hemorrhage has ceased for several days. There are cases on record where this line of treatment was successful. It is however impossible to be certain, whether the bleeding has ceased definitely, and on the other hand every further loss of blood, considering the low condition of the patient, must be avoided. Even in the cases of extreme adynamia we prefer to keep the patient in bed, apply ice to the abdomen and give some doses of quinine, after the method of *Liebermeister*. The building up of the patients strength, with the aid of wine and the proper kind of food is obvious.



# PERFORATION OF THE INTESTINES. PÉRILLOINTIS.

The differential diagnosis between these two complications is difficult, a circumstance of little importance as far as treatment is concerned this being identical and requiring almost the same remedies as the intestinal hemorrhage. The baths are to be discontinued at once, the abdomen is to be covered permanently with ice-bags, and this is to be continued until the peritoneal pains have disappeared for several days.

The secondary peritonitis produces less severe symptoms than the primary, and the inflammation of the peritoneum can proceed in installments in the course of typhoid fever. This fact has to be kept in mind so as not to let up too early with the local application of cold. Every intestinal movement is even more to be avoided than during the hemorrhage. Food and drink must be quite cold and administered in small quantities at least as long as there are present dangerous symptoms. Enemata are harmful even if constipation is present. The remedy to keep the intestinal tract immovable is opium in large doses. We prefer the liquid preparations and give 0,1—0,3 grm. ( $1\frac{1}{2}$ —3 grains) in a mixture, or 2, 3 to 4 grms (15, 30 to 45 minims) of tincture of opium. Still better are morphine injections, 0,02—0,05 grms (one-third to five-sixths grs.) per day. These strong

doses are less dangerous than one might imagine; the intensity of the pain is the guide for the tolerance of the organism. The patient must be kept in a condition of narcosis which is less dangerous than the peritonitis.....As in the case of intestinal hemorrhage the fever is to be combatted by the local application of cold and quinine, careful diet and absolute rest to be enforced, and the constipation produced by the opium to be let alone for a long time. Of course if cases are treated systematically, and from the beginning with water, these complications will only occur exceptionally, for—we repeat—this method if used in time will keep within bounds the intestinal changes peculiar to typhoid fever, which are the cause of the perforation and peritonitis.

(The following paragraphs have been omitted: Disturbances of the digestion. Diarrhoea and meteorism. Constipation.—Severe chill after the bath.—Abscesses. Furuncles. Decubitus.—S.)

THE TREATMENT OF THE “DEGENERATED” (COMPLICATED, CRITICAL, NEGLECTED) CASES  
ACCORDING TO BRAND.

According to the definition of degenerated typhoid fever, cases of this character present a variety of clinical pictures, their prognosis is

doubtful, and the indications which are to be satisfied in their treatment are difficult to fulfill.

This is particularly the case if the water-treatment is requested as a last resort for dying patients. For now the lack of time is added to all the other difficulties—the patient dies before the method has time to unfold its powers.

While in Germany, where the profession has become more and more convinced that the beginning of the disease and not the end is the proper time for the hydriatic treatment, such cases have become rarer, they must necessarily be met with more frequently there where the cool-bath-treatment has not yet become popular. Hence a short direction for the management of such critical, neglected and complicated cases may be of interest.

The consideration and decision whether such a desperate case is to be subjected to hydriatic treatment must rest not so much on the general condition of the patient but on the intensity and extensity of the local pathological changes.

The general condition, generally dependent on the fever, is apt to improve—providing the time is not too short—almost in every case under the use of water

But hopes kindled fresh are often treacherous. In spite of the general improvement death ensues in consequence of local conditions.

The indications in the degenerated cases of typhoid fever are not as simple as in the normal cases. The fever is not the main factor with which we have to deal, but there exist a number of special conditions that have to be taken into account.

If such a case of degenerated typhoid fever comes under treatment, the chief concern often is to remove the most pressing dangers to life, *to resuscitate the power of resistance of the organism which has almost vanished, before one can think of treating the disease proper.*

On the whole the indications are (1) to subdue the fever which is still present, (2) to relieve the various local disturbances and complications.

To get *control of the fever* is as a rule not a difficult task. But the kind, form, and mode of application of the water must be regulated by *the condition of the brain and nervous system*, and their organs are generally in a bad way. They are in a condition approaching paralysis more nearly, than a state which will allow a normal function and activity, and a stimulating procedure may bring about the latter condition, but may, if carried to excess be the cause of the former, so that the difficult problem is met, of applying just the proper degree of stimulation. *Great energy is plainly not in place in the treat-*

*ment of degenerated typhoid fever. The water-treatment demands the greatest energy in the beginning of the sickness and the greatest delicacy and caution in the hours of danger during the later periods of the disease.*

It is a great error to suppose that under the critical conditions, which will be described, anything can be accomplished by force in the application of hydriatic procedures

Keeping this in mind there is but one procedure in place in the beginning of a treatment of a case of this form, viz: the gradually cooled down full bath with affusions of decreasing temperature. This is repeated according to the condition of the patient but not oftener than every three hours, to bring about, with guarded haste a condition of apyrexia. In case of improvement the tact of the physician must decide when and if the cool full bath is to take the place of the gradually cooled bath.

In case however that it is not possible to remove in reasonably short time the brain symptoms the patient, after his hair is cut off short, is to be placed into a half-bath reaching to his umbilicus, of a temperature of 32° C. (90° F.) the surface of his body rubbed vigorously and cooler and cooler water to be poured over him. First with the water of the bath, then with water of the temperature of 80, 70, 60, 55° F, 2—3



quarts at a time. The duration of the bath must not exceed ten minutes. After the patient is brought back to bed, his feet are wrapped up in flannels, saturated with hot water, and well wrung out, and these compresses are to be renewed every 10 minutes for two hours. The baths are to be repeated not oftener than every two hours. In case the effect has passed away earlier than the time for the next bath has arrived, or if no effect has been produced by the same, cold water may be poured over the head without taking the patient out of his bed. It is also advisable to cover the head with ice-cold compresses. The necessity of the administration of strong wine in large quantities, or Stoke's cognac mixture, (Cognac 2 ounces, yolk of one egg, cinnamon water 2 ounces, simple syrup 1 ounce. Table-spoonful every hour) is self-evident.

As long as the patient continues to breath, these exertions must be kept up assiduously, may the patients appearance be ever so hopeless. If there is a possibility of his recovery, this procedure will bring about the desired result. There are examples on record where such determined efforts have been crowned with success.

After the patient has regained consciousness one gradually and carefully under the use of the gradually cooled full-bath approaches the ordinary anti-febrile proceedure which finds its

expression in the ordinary formula *however with this single restriction*, that the baths in the treatment of the degenerated typhoid, have as a rule, to be shorter than in the treatment of the normal typhoid—just long enough to create and keep up the necessary afebrile condition. As a rule ten minutes would seem sufficient, excepting in the atactic forms.

The treatment of the local symptoms by the water can, unfortunately, not be as direct as is desirable. Happily this is not as necessary as under other treatment.

If the fever has ceased and the effects of the afebrile condition had a chance to develop, such conditions as the normal activity of all the organs, excepting those which are the seat of pathological changes, further a good appetite and a sufficient nutrition with an increase of strength—such conditions cannot but be favorable to the diseased organs. For it is an undeniable fact that local disturbances get worse while the fever continues and improve as the fever disappears.

Effects of the cold bath, which have not yet been mentioned, and which have not received the estimation they deserve, are those of *stimulation* and *revulsion* the latter of which can be increased by energetic *rubbing*.

On the direct and indirect effect of cold to the living organism, physiology teaches the

following: (Ludwig Lehrbuch der Physiologie des Menschen, Bd. I. S. 310. u. f.) "Amongst the influences which are able to call forth the activity of the irritable nerves, cold, (heat) and mechanical causes are the first to be mentioned. Free heat only excites in us the sensation of warmth or cold, if it is either increased or decreased in intensity and ceases to have any effect if it acts on the skin in a uniform degree. The strength of the sensation, (irritation) depends (a) on the rapidity with which the change in temperature takes place; (b) on the temperature of the skin; (c) on the extent of surface of the skin exposed at the same time to the change of temperature. The greater, further, the difference between the temperature of the skin and that of the agent acting on the same, the more lively will be the effect produced."

Whether the half-bath with cold affusions, or the cold full bath is employed in the treatment of typhoid fever, in either case the change of temperature is a brusque one--the difference in the temperature of the skin and of the water used being considerable, about 26° C. (47° F.) and at the same time the whole surface of the body is exposed to the sudden change of temperature, in short all the conditions necessary for a powerful stimulation are given. The cold half-bath and full-bath are therefore capital stimulating

remedies. And why should that be denied? Does not daily observation in cases of syncope and other similar conditions show the powerful reviving influence of cold water on the organism? And who ought not to know, that in typhoid fever consciousness can be regained and preserved by the use of the cold bath without producing an essential reduction of temperature?

Aside from the abstraction of heat and the stimulation, a third effect must be ascribed to the cold bath, which is not so striking, but which according to the observations of *Winternitz* is undeniable. That is the revulsive effect. "After the influence of cold on the cutaneous surface of the whole body, (*Winternitz*, *Wien. Med. Wochenschrift* 1868) the tonus in the contractile structures of the skin and the blood-vessels in particular, is diminished, the muscular coat of the arteries relaxes and thus the blood vessels of the skin are considerably dilated and their capacity as a whole increased. The vascular channels will not be tensely filled with blood. Each systole of the heart throws a portion of blood into the arteries, which take it up with avidity, without becoming tense, because their volume being increased they can carry more blood than before. In the same way the relaxed veins can stow away more of the blood

which passes into them, on account of their increased capacity, in the same way as in the *Klopf-versuch* of Goltz. Just as the dilated mesenteric vessels, in the experience of G., so here the relaxed blood-vessels of the skin, acting like a sponge, absorb the blood from the inner vessels, relieve them of their contents and decrease the tension existing there. The effect of such a filling of the blood-vessels of the skin will therefore be the cause of a lower blood-pressure in the internal organs, of a decrease of the amount of blood they contain, of a retardation of the flow of blood, and of the activity of the heart and other internal organs, a reduction of temperature and a quieted nervous system.

The essential part however of this process depends mainly on a *real derivation of blood to the skin*.

These general effects of the bath are aided by compresses, which according to their temperature, size and more or less frequent renewals act antiphlogistically or stimulating; in the former way if they are changed continually or kept at the same temperature by means of ice, in the latter way, if they are allowed to become moderately warm, before they are changed, in which case there is produced with each change a slight degree of shock. In as much as in typhoid fever it is not so much a condition of inflammation



as a semi-paralytic condition of the intestines with which we have to deal, the latter form of applying the compresses is the more common one and a change every 15—30 minutes generally advisable. *In a cool condition however the abdomen and chest ought to be kept all the time.*

Summing up it can be said, that in the degenerated typhoid fever the hydriatic treatment (1) will bring about a condition of apyrexia, (2) will remove the semi-paralytic condition of the different organs, (3) relieve the diseased organs by revulsive action.

All the forms of degenerated typhoid fever, which can be reached by the activity of the baths will be cured, the rest will not.

To aid the activity of the baths, alcoholic stimulants are of importance.

*Murchison*, after a rich experience, gives the following advice in the use of alcohol:

“In individual cases, the chief indication for the use of alcohol is derived from the state of pulse and heart.

A soft compressible pulse, and still more an undulating, irregular or intermitting pulse, or even an abnormally slow pulse (40 to 60) are stronger indications, than more rapidity. If stimulants quicken the pulse, they are contra-indicated.

2, Coldness of the extremities is an indi-

eration for alcohol, especially when at the same time the temperature of the trunk is considerably elevated.

3. The more the typhoid state (i. e., stupor, low delirium, tremor, subsultus) is developed, the more will alcohol be demanded.

4. The presence of complications, as a rule increases the necessity for stimulants.

Port, sherry, brandy are the forms in which alcohol is best given, but when a weaker stimulus is wanted, claret answers well. Sherry and port contain from 17 to 24 per cent of alcohol, spirits from 50 to 60. Spirits ought to be given diluted in cold water or milk. But where there is great prostration and especially where the skin is cold and covered with perspiration, the the best stimulant is hot brandy—or whisky-punch, or wine-whey.

Stimulants ought to be given in divided doses frequently repeated. In urgent cases, the dose may be repeated every hour and as a rule a larger dose will be required during the night and towards morning, that the vital powers are at the lowest ebb.

It is very rarely necessary to give more than eight ounces of brandy at any period of the fever.

As soon as the symptoms for which alcohol is given begin to recede, the quantity ought to

be reduced and smaller doses ordered at longer intervals."

These rules of *Murchison* are so excellent that they ought to be followed by everybody.

Before each bath a liberal quantity of stimulant is given; after the same, warm milk, boullion etc. After midnight the doses of wine or brandy ought to be larger than during the day.

After the symptoms diminish the quantity of spirits or of wine (*Haut Sauterne*, *Chablis*, *Monbrachet*) is reduced, not however below half a bottle (of the wine.)

In case of a collapse wine is not sufficient. It is better to give a tumbler of rum or cognac with hot water (half and half) and if necessary to force the patient to take it.

As far as the diet in the degenerated typhoid is concerned, this ought to be as nourishing as the condition of the patient will permit. The chief article of diet is here also milk, either pure or mixed with coffee or tea, and broth prepared with chickens or pigeons' meat, mutton or beef, mixed if possible with the broth prepared from calf's-feet, and later on eggs and meat extract may be added. Toward the last days of the sickness meat may be allowed even if fever should still be present, Raw beef-steak or the ordinary steak—chicken or pigeon are to be preferred.

In case the appetite is very strong I order as long as liquid nourishment is given once or twice a day a dose of bi-carbonate of soda after the meal.

All the rest of the conditions and requirements of the hydropathic treatment must be followed out consistently and energetically, fresh air must be abundant, and the nursing perfect. Each case which recovers may be counted a master-piece, so to speak. Without the support of the friends and the persons who do the nursing, success is impossible.

In case it has been possible to bring forth some measure of improvement by these means, the energy of the treatment may be *cum grano salis* somewhat reduced. Short lukewarm half-baths with a moderate amount of affusions are useful in helping on convalescence. Two to three of such are generally sufficient, later one, two, at last but one. The compresses to the abdomen are kept up to the last, but changed at greater intervals, always however after eating.

In the majority of cases this line of treatment can be carried out and is sufficient to save the patient, if such a thing is possible. Only very rarely, in very desperate cases, where life is hanging by a thread as one might say, and where one might hesitate to take the patient from the bed into the bath-tub, we recommend

to prepare the patient for the bath by washing the whole surface of the body with the wet hand every half hour, and by the application of *cold rather wet compresses to chest, abdomen and back* also to be changed every half hour. In case that under these procedures the symptoms improve and the pulse grow stronger, the bathing ought to begin without much loss of time.

#### THE TREATMENT OF THE SYMPTOMS AND THE SPECIAL FORMS OF DEGENERATION.

The condition of the brain and nervous system in the degenerated typhoid is not any more that of the normal typhoid. This conclusion can be formed by considering on the one hand the readiness with which apoplexies, paralyses and convulsions occur, and on the other, the difficulty which is experienced in renewing the somnolent condition and the coma, or in other words to bring back the patient to consciousness, a feat not so very difficult in the management of the normal typhoid. Remembering the long time that detrimental influences have been acting on the brain and nervous system, the great depression of their functions, the malnutrition of these organs continued week after week, the hyperaemic condition during the period of exacerbation, and the insufficient equalization, due to the great depression, in the



time of the remission, considering further that degeneration only takes place if the condition of the brain and nervous system have been deeply altered, the supposition of material changes in these organs becomes a certainty. It is true the post mortem examinations do not reveal such facts, which would explain these marked symptoms. Nevertheless the anaemic condition of the brain, pointed out by *Buhl*, its infiltration with a serous fluid and the accumulation of serum in the ventricles may explain a part of the symptoms. In all probability there exist material changes in the brain and nervous system, which the means at our command at present, do not reveal, and the recognition of which must be left for a future period of time.

The direct consequences of these changed conditions of the nervous organs are a paralytic condition of the brain, of only two frequent occurrence, apoplexies, paralyzes of different parts of the body, psychoses, mental weakness. The indirect consequences brought about by deficient regulating influence of the brain are incomplete recovery, chronic condition of ill health, and sequelae of all sorts.

As far as treatment is concerned, water is as powerless as any other remedy to influence these alterations directly. All what can be done is to take good care of the function of the brain

yet intact, and gradually to conduct it back to the normal condition, or in other words to raise the semi-paralytic condition of the brain and nervous system, to support their regulative functions to aid in the excretion of morbid products and to accelerate the formation of new blood.

The (*versatile*) form of the affection of the brain characterized by excitement and restlessness (ataxia) demands greater caution than the (*adynamic*) form in which the patient lies quietly on his back in a condition of deepest unconsciousness. While in the latter form vigorous local applications of the water to the head and even to the whole surface of the body in the form of affusions are applicable and their frequent repetition necessary, in the former variety anything like shock is to be avoided, the temperature of the water must be high, affusions are sparingly to be used and a prolonged action of the bath is demanded, as has been described previously.

[I add here the passages to which the foregoing words refer, from an earlier part of the book. S.]

On the whole (im Grossen und Ganzen) it can be said that the treatment of the atactic and adynamic forms does not differ essentially. In case there is present neither degeneration of the

process nor any such complication as alcoholism, the ordinary treatment will be sufficient to gain the desired result.

There are however exceptional cases, where it is important that the physician should find the reasons for in order to remove the obstacles. Thus in observation No. 11, an excessive irritability of the brain was the cause.

It is more frequent for the treatment to fail to bring about the desired result in the atactic, than in the adynamic forms of the disease.

For the atactic form I should recommend baths of a higher temperature and of longer duration and affusions only in a moderate degree baths of 25—22° C. (77—72° F.) of 15—20 minutes duration and nothing like brusque affusions, but only a gentle but continuous cooling of the head. In the first half of the sickness a dose of morphine (0,02 grm.)  $\frac{1}{3}$  grain is often exceedingly useful and in the latter half especially if sleeplessness should continue for some time, wine in large quantities.

In the adynamic forms however if the general formula should not be sufficient a more energetic form of treatment is applicable, either full-baths of 10—12° C. (50—54° F.) (after *Jürgensen* and *Heubner*) of 10 minutes duration or, what I prefer, the half-bath of 25°C. (77° F.) of 10—15 minutes duration with quite cold

affusions and energetic rubbing, which will generally be sufficient.

(It must not be forgotten that the directions are given for the treatment of normal cases, where the resistance to the cooling process is still great. S.)

*Particular attention has to be paid to the regular evacuation of the bladder.* In case of retention of the urine—a bad symptom—the bladder has to be emptied twice a day by means of the catheter.

If convulsions set in, the process is discontinued. One waits until the attack is over; if an excessive degree of temperature is present, this is combatted by cold compresses applied to the anterior and posterior surface of the trunk, and before a new bath is given the question is to be considered, if not the attack was called forth by the *form* in which the water was administered. Perhaps the water had been too cold and the shock produced the attack, and a fresh one may be avoided by using warmer water for the next bath.

Psychical disturbances in the form of maniacal or melancholic delirium, do not demand a change in the procedure. The chief indication has to be satisfied and where side-indications exist these will be met without difficulty by attending to the principals laid down.

In the treatment of grave, typhoid brain affections one point must not be lost sight of, viz: sleep. *Griesinger* speaks to the point, when he says: "Of whatever character the disturbance of the brain and nervous system may be and of whatever intensity, from the mildest disturbances to the gravest status nervosus, one thing alone will restore the normal equilibrium and relieve the condition—sound healthy sleep." Of course sleep must not be confounded with stupor.

To produce sleep by means of the water-treatment will generally present but little difficulty. After the chill has passed away it is an exception to the rule, if sleep does not set in to continue until the next exacerbation makes itself felt.

In case sleep should not set in the character of the bath has to be modified, only in case of extreme necessity should morphine be used in the degenerated typhoid.

(On the other hand, if narcotics had been administered all along during the course of the sickness it would not seem wise to discontinue them. S.)

Amongst the *abdominal symptoms meteorism* and *hemorrhage* demand attention. The meteorism is generally reduced to a low degree by the general procedure and the compresses, which



improvement continues until reconvalescence is established. This moderate degree of distension does not inconvenience the patient and will hardly be noticed by him. In very grave forms of the disease however, where the muscular coat of the intestines is almost paralysed, and the distension therefore extreme, the action of the water is not so conspicuous. Under such circumstances, if one wishes to do something besides using the water, charcoal may be used according to *Scharlau* or *Bang* or calomel which *Friedreich* recommends so highly.

The intestinal hemorrhage of typhoid fever is either due to lesions of the capillaries or the arteries. I distinguish therefore a true and a false hemorrhage. In false hemorrhage the faeces contain only traces of blood, or blood is voided in small quantities only."

(Here I (S.) should like to insert a passage from another part of Brand's book. Although not concerning the degenerated typhoid in particular it discusses the question whether the baths are to be discontinued in case that blood appears in the discharges.)

"As far as intestinal hemorrhage is concerned, I formally advised the discontinuation of the baths, not for the reason that the baths produce a congestion in the intestinal mucous membrane—which is not the case, but because

I was of the opinion that movements necessarily connected with the bathing had better be avoided. All observers have followed my example, more on account of the first (false) reason than on account of the second one. To-day I am sorry that I did set up this contraindication. Reading the reports it can be seen that there was too much readiness shown in stopping the baths *and that thus the patient in order to escape the minor danger was exposed to the greater of succumbing to the fever.* I believe that the principal to discontinue the baths, as soon as blood appears in the discharges is false. The correct principle is this: *The baths have to be discontinued in true hemorrhage, that is, when the loss of blood makes it perceptible in the pulse and the temperature.*

If that is not the case the baths have to be continued and all that is necessary is to be as gentle as possible in transporting the patient into the bath and back into bed. Nobody has offered any evidence to show that the bath is instrumental in producing hemorrhage. I recount six cases of false hemorrhage, as I call it (capillary) where the bathing was not interrupted for a moment and the fever took its normal course.. Mr. *Glénard* has gone on with the bathing even when true hemorrhage was present without any harm being done. Further, Mr. *Soulier* has shown experimentally that the cold

bath produces not an increased redness but pallor of the intestinal mucous membrane. It would thus appear that there is no causative connection between the cold bath and intestinal hemorrhage. This view is further supported by the observation pointed out by *Wunderlich* that hemorrhages rarely occur during or immediately after the bath, but generally several hours later, that repeatedly compact faecal discharges take place between the bath and the bleeding, and above all by the fact that the water treatment diminishes the frequency of the intestinal hemorrhages."

The capillary hemorrhages may, according to *Brand*, be due to excessive hyperaemia attending the pathological changes in Peyer's patches or to slowly healing ulcers in a later stage. These hemorrhages are generally small in amount and demand but little attention. The variety of capillary hemorrhage from the bowels, which is a part of the condition generally named "dissolutio sanguinis" and accompanied by bleeding from other organs is generally fatal and not amenable to any treatment.

The true intestinal hemorrhage due to the formation of sloughs and the arrosion or arterial vessels is apt to be large in amount and to make itself felt by a rapid pulse and all the symptoms of collapse.

What *Brand* has to say on the treatment is the following: “The conditions present when arteriel hemorrhage occurs in a case of typhoid fever, are more unfavorable than under other circumstances, because the blood on account of a deficiency of fibrin and albumin has no tendency to coagulate and thus makes it difficult for the openings in the arteries to be plugged with coagula, and because the decreased contractility of the arteries interferes with the formation of thrombi. To this has to be added that the diarrhoea, which usually is present, does not allow the necessary rest of the diseased part, and that the fluid contents of the intestines readily carry along with them the live-saving coagula, and that the condition of the nervous organs does not support the efforts of medical art. The importance of the latter against these complications is too evident. The fatal issue is the rule and hemorrhages which end favorably are almost all of capillary origin.

Nevertheless it would not be proper not to aid the organism as far as it is in our power.

For this purpose absolute rest of the body is prescribed, in cases of arteriel hemorrhage, abstension from eating as far as this is compatible with the maintainance of life, and cold compresses, which must never be allowed to become warm, to the abdomen, for a period 3—4 days. The

baths are discontinued. To place the patient into the bath-tub and back to bed would interfere too much with the first demand of absolute rest. Fever must be combatted with quinine and thirst with small pieces of ice placed on the tongue.

If hemorrhage returns, it may be advisable from a moral standpoint, to administer styptic medicines. The liquor ferri chlor, and the plumb. acet. are recommended. I prefer the hypodermic injection of ext. ergot. (Bonjean.) Formerly I have used iced enemata but considering that absolute rest of the intestinal canal is absolutely necessary for the occlusion of the vascular erosions, I now omit them, and should prefer to recommend large doses of opium. Constipation lasting a number of days is certainly advantageous. After 3—4 days when it is probable that the vessels have been closed, the bowels may be opened by cold water enemata, to remove the decomposing blood.

After the hemorrhage has ceased a number of days, a careful effort to replace the loss by proper diet, wine etc. may be made and gradually the ordinary course of treatment can be taken up again.

In the epidemic of 1858-9 I met five cases of genuine intestinal hemorrhage of which one died; since then I have not met any further cases.



As far as the *respiratory organs* are concerned the following pathological conditions need consideration: ulcerations of the larynx, hypostatic conditions, inflammation and gangrene of the lung, and pleurisy.

I am of the opinion that some, if not many physicians, who otherwise might not be disinclined to use the hydriatic treatment, are deterred from its employment in case chest symptoms make their appearance. Lung diseases to be treated with water is something so novel, and the fear of exposing the patient to catching cold is a thought which will at once be uppermost in the mind, when this idea is considered. I myself found it difficult to free myself from the fear of harming my patients, suffering from lung affections, by using cold water. If however the water is employed in a rational way, there is less danger here of catching cold than under any other form of treatment. I am able to quiet timid minds on this point. Aside from a number of cases of inflammatory affections of the larynx and bronchial tubes I have treated a number of pneumonias of every degree of severity, either with water alone or in combination with digitalis with the most happy results. In case of purulent pleuritis where all efforts to mitigate the terrible distress of the patient with medicine or abstraction of blood were without avail, I have

produced comfort by means of the water, have removed the most imminent danger and thus created a possibility for recovery, which, after the pus having been evacuated through the lungs, took place in a most satisfactory manner. I often have suppressed the hectic fever of accute tuberculosis of the lungs with this remedy, and have been enabled to produce an increase in the body-weight. In two cases of children I have seen cavities in the lungs, diagnosed by others besides myself, heal under the use of water, and am in the habit of making whooping cough run its course in 4—6 weeks—never, not in a single case, did I see any reasons for complaint either on account of catching cold or of any other harmful incident. All that is necessary is to observe the principal, to avoid doing too much in the treatment of lung affections by means of water, and not to interfere with the critical exertions of the system, especially the production of sweating in acute affections.

In case of *ulcerative processes in and about the larynx* all local treatment is superfluous. Only general treatment, an improvement in the constitution of the blood, holds out some hope. Wet application are as powerless as external irritants, both being a source of annoyance to the patient. In my opinion it should be the aim of treatment to bring the general process to a

rapid a termination as possible, and if symptoms of suffocation should demand it to perform treacheotomy to gain time for the healing of the ulcer. Time is the prime factor in the cure of these affections. In case that ulceration spreads from the mucous membrane to the cartilages, recovery is impossible.

The *hypostatic condensation of the lungs*, in consequence of patholgilical changes in the blood of a grave character, and of a very low condition of the functions of the brain, does not demand so much local treatment, as an energetic and determined carrying out of the general treatment, and a low temperature of the bath. Wet compresses applied to the chest are valuable aids; nor are affusions to be neglected.\*)

The condition in the presence of *catarrhal and croupous pneumonia* are, as far as treatment is concerned, about the same as for hypostatic processes. It is always the general typhoid

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\*) From a letter from Dr. Brand: "In hypastatic condensation of the lungs the ordinary temperature 20° C. of the water is to be used and water of 10° C. are used for the affusions. The patient sits in the water up to the pit of the stomach, so that the thorax remains outside of the water. The same is rubbed thoroughly. The affusion are to be of short duration but to be repeated often, to get a stimulating effect, which is the desired object."

affection which will demand most of the attention, while the local conditions deserve but minor consideration.

The principles of treatment have been communicated in a former part of the volume.

(The passages to which Brand refers are the following: S.)

In as much as the treatment of the croupous pneumonia is at present (1877) undergoing a transformation, it may not be out of place to touch upon this topic in this connection it being germane to the question under discussion. I assume that the pneumonia under consideration is of not a mild character, so that it calls for active treatment. For it is well enough known that in a large number of cases of pneumonia according to the accepted opinion, very active interference is not desirable, and it is better to leave the pathological process take its course undisturbed.

When 25 years ago I entered the profession the treatment of pneumonia consisted in venesection, the use of tartar emetic and a weak infusion of digitalis.

Very soon after that the important essay of *Dietl* appeared: Venesection in pneumonia, in which the use of blood letting was deprecated. The reasons of *Dietl* could not be gainsaid. The

transition from the old to the new line of treatment was bad. The public, knowing the relief which a venesection brought about in pneumonia, demanded the same, and it took years before it acquiesced in the withholding of the procedure.

The results of the new method compared with the old could hardly be called favorable.

A little improvement was brought about by the teachings of *Tranbe* that digitalis in larger doses was to be administered to reduce the pulse and temperature. If that could be accomplished a certain amount of relief of the subjective symptoms as well as a more favorable course of the disease could be recognized.

Unfortunately however it became clear, that in a certain percentage of cases this effect of digitalis could not be brought about. In this class of cases the patient generally would succumb to the disease in spite of the use of ipecac senega, sulfur, aurat, antimonii, liq, anumonii, anis, etc, etc.

Now and then I succeeded by the use of the cold pack and energetically combating the fever to produce a change for the better, and it was interesting to observe how after the reduction of the temperature digitalis at times produced its effect now in a supplementary way.



On the whole however there were no reasons for being proud of the results of this form of treatment. Only too often patients died, in whose treatment love, care and skill had not been spared.

The treatment was deficient in one important matter, which *Juergensen* pointed out. Through him first the correct indications for the treatment of pneumonia were made known.

If this ingenious observer, who deserves so much credit for his labors in the treatment of typhoid fever, had written nothing else, besides his article on pneumonia in the "Handbuch der Krankheiten des Respirations apparatus, Leipzig 1874. W. Vogel," he would have deserved well of humanity for this alone.

According to *Jürgensen* the danger in pneumonia proceeds not so much from the diseased organ as from the heart, which suffers at the same time under the influence of the fever and the lung affection.

*A pneumonia patient dies from insufficiency of the heart.*

The aim of treatment therefore consists in:

- (1.) Protecting the heart pro phylactically against weakness.
- (2.) Removing heart-weakness which has developed

The prophylaxis is accomplished by keeping down the fever and the heart weakness is combatted by stimulants.

The first part is selfevident and nobody perhaps would offer any objections.

The second part however, in the way in which Jürgensen theorizes about it, is altogether new, and demands that his reasons should be brought forward.

“The consequences of the heart weakness,” he writes l. c. pg. 171, “are known to act in placing upon the right side of the heart an extra amount of labor. Through diminished activity of the ventricle a stasis in the pulmonary circulation is brought about and with it an insufficient filling of the left ventricle; and in higher degrees of this conditon an accumulation of blood in the systemic veins partly on account of the difficult outflow into the right ventricle which is never entirely emptied, and partly on account of the diminished vis a tergo. If this condition reaches a very high degree, oedema of the lungs may follow; in fatal cases it hardly ever is absent. The emptying of the left ventricle under all circumstances has this very important drawback in its wake; the working muscles, heart and respiratory muscles do not receive a sufficient amount of blood, which in turn endangers in the highest degree their ability

to perform their functions. It is therefore more correct to assign as the cause of death in pneumonia insufficiency of the heart instead of the customary oedema of the lungs."

To antagonize this insufficiency of the heart *Jürgensen* recommends stimulants. These excite the heart to perform more work. Every strong impulse of the heart brings, by forcing more blood from the over filled right into the left ventricle, more oxygen to the heart, removes the substances of retrograde metamorphosis, and in the first place brings aid and support to the heart itself. *The stimulant is at the same time the whip and the oats for the heart.* (*Jürgensen.*)

These indications are established for the ordinary genuine crupous pneumonia; with the introduction of the stimulants the defect which exists in my method is remedied. The question now arises whether these indications will hold good for the genuine secondary pneumonia of typhoid fever.

*The pathological process, the conditions in the lung, being the same here as there the same indications can and must govern the treatment.*

The only difference, which exists, is that here we have before us a reconvalescent from a disease which is characterized by intense affection of the lungs and fatty degeneration of the heart. These dangerous complications must be

taken into account; they are the principal source of danger. But when, even in the genuine pneumonia, the issue of the cases depends not so much on the intensity of the process, as on the resisting power of the organism, this holds good in a higher degree in the secondary pneumonia.

The means to combat the fever in genuine pneumonia are digitalis, veratria, quinine and the cold bath. Other means there are not in existence. (1877. S.)

The first two remedies cannot be employed in secondary pneumonia because they are apt to produce collapse, for which the patient is disposed already, and which under all circumstances must be avoided.

Quinine meets the condition better, of which *Jürgensen* says, that it reduces the temperature without being detrimental to the heart, which fact however *Lindwurm* combats. Against the way in which *Jürgensen* has advised quinine to be administered objections can hardly be made.

But quinine is not powerful enough to reduce the fever in a sufficient degree in pneumonia. Recourse must be had to the cold bath which finally is and will remain the most simple and reliable antipyretic which we have.

A pneumonia case in a bath of 10° C. temperature—the very idea is enough to make the old-school physician shudder.

*The cold bath however, used in the right time in the right way, and with the necessary precautions in the treatment of pneumonia is not only free from all danger, but is the most reliable sheet-anchor, especially in those cases where in consequence of the attack of typhoid fever which had preceded the pneumonia the heart has suffered.*

Together with Mr. Glénard I have treated during the winter of 1870-1 29 cases of pneumonia of the gravest character in this way without losing a single case.

By the right time is to be understood the febrile stage of the disease up to the time when the crisis is to be expected, to the end of the 8th, latest the 9th day under the conditions prevailing here. *After that period the bathing is discontinued, even if the temperature should be high,* in this stage stimulants (wine) only are in place. Pneumonia of shorter duration I am not acquainted with, if such should occur the appearance of the crisis would be the indication for the cessation of the baths,

Further, I understand by the right time the correct determination of the number and time of the baths. While during the course of the typhoid fever the indications of keeping the fever down is absolute, it is sufficient in the treatment of pneumonia to keep the same



within moderate bounds, to bath perhaps only at 40 C.\*

As *precautions* finally are to be mentioned the stimulation of the heart before and after the bath by some strong stimulant—if necessary the avoidance of the shock and an equable abstraction of heat by keeping the patient in the water up to his neck.

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\* From a letter from Dr. Brand: "All observers agree with me, that when a pneumonia is found in the beginning of treatment, or if the same sets in in the course of treatment, the general principles, of the treatment of typhoid fever have to be adhered to, and one continues in the treatment as though the pneumonia were not present. If however it sets in after the typhoid-fever-process proper has run its course, that is secondarily, it is perhaps better not to bathe at 39°C and below that, but only when the temperature has reached 39,5°C excepting in the presence of great cardiac debility when a circumstance which would demand frequent stimulations. It need not be mentioned that the stimulating compresses—not ice—are of great importance to the heart—and this keeps the nurses engaged, so that it cannot be said that nothing is being done for the patient.

How often is the bath to be repeated? Our answer to this question follows from what has been said above. At 39,5 C if the fever is the one domineering factor; every three hours if the heart has the upper hand. In case the heart is too weak, something not often the case, the compresses and alcoholic stimulants have to do their part."

Under certain conditions a strong revulsion by powerful frictions and warming up of the extremities after the bath are of great value.

If heart-weakness in spite of all this sets in or if it is present when the patient comes under treatment, the temperature at the same time being high, the delicate question arises, is a bath to be given or not?

This question forms a difficulty which baffles almost every one. *Hic Rhodus, hicsalta.* If for the insufficiency of the heart nothing is done, the fever is not combatted, the patient is lost—so much is certain.

Juergensen says on this point, l. c. pg. 177, “The bath for the time being augments the labor of the heart but on the whole diminishes the same. If it is able to perform the transient extra exertion the bath is to be given; in the opposite condition, not. As a practical rule: In case that a very severe condition of collapse is not present, then by using the necessary care in the selection of the stimulants and the temperature of the baths, the majority of the patients can be treated by direct abstraction of heat and must be so treated because *the most dangerous enemy to the heart is the elevated temperature*, and to make the same innocuous there is no more reliable remedy than the cold bath.”

This proposition will be admitted as true, even if in case of an unfortunate issue the physician and his method will have to bear the blame, the conscientious physician ought not to allow the possibility of saving the patient in this way to pass by untried.

Furthermore as the gradually cooled down full or half-bath are the proper modifications of the treatment to meet such cases, any reproaches could perhaps be avoided or at least be weakened.

To recapitulate: The treatment of pneumonia consists of the administration of quinine, the stimulants and the cold bath. These are the agents of the hydriatic method.

One is justified therefore in saying: *The hydriatic treatment of the late and secondary pneumonia of typhoid fever, meets the indications completely.*

He who does not wish to make the unpleasant acquaintance of a primary pneumonia in typhoid fever will only have to follow the principle of using the baths *regularly* and from the *very beginning* of the sickness.

Does the same for any reason nevertheless seem imminent colder baths 16° C. (61° F.) have to be used and ice water for the affusions and a daily curve of the average temperature be drawn to controls the nursing, to see whether it has been

carried out without any faults and short-comings. This procedure is kept up even if the pneumonia actually develops. Under no circumstances should warmer baths be used or the bathing be discontinued.

To prevent secondary pneumonia the half-bath is applicable after the fever has gone down and a proper protection of the patient against changes of temperature. In the treatment of the same the ordinary principles are to be followed only that 40° C. (104° F.) is the temperature when a bath is to be given and chest compresses—also to the back are to be applied.

*Gangrene of the lungs* I have observed twice, once the patient recovered, the other case, where both lungs were affected, succumbed. This form of the degenerated typhoid is not so rare, D. A. Willigk mentions in his report on the pathological institute in Prague, that it occurred there twelve times within four years.

The prognosis is bad, *Vogt* saying that these cases are always fatal. Yet *Lebert* mentions a case which recovered and *Lederer* a similar case of a twelve year old girl, which also recovered. To this my case is to be added.

As far as treatment is concerned the local besides the general was almost nil. The blood changes are so profound, the functions of the

nervous organs at such a low ebb, the organism in all its parts so deeply involved, that the dangers which present themselves from hour to hour and from day to day demand all the attention. To keep the patient alive from hour to hour is the chief aim; everything depends upon time. One must accomodate oneself to the changing condition of the patient and apply the principles which have been laid down. The gradually cooled down full bath will under such conditions be of the highest service.”

(The paragraphs on erysipelas, decubitus, pyaemia have been omitted, because no special modifications of the use of water is mentioned to meet these conditions. Of course the general hydriatic treatment, when they are present, is not omitted by Brand. S.)

If others will read the directions for the treatment of the complicated and degenerated cases as I do, they will have some difficulty in putting them to practice and that for a number of reasons. In the first place *Tripier* and *Bouveret* and *Brand* do not harmonize in every particular as they do in the treatment of the normal cases; thus the French observers advise not to use cold affusions while *Brand* devotes a page and more to point out its usefulness. In the matter of decubitus also T. and B. discontinue the bathing if the same is extensive, while



Brand goes on with the treatment, as though it were not present. Likewise in the directions of Brand I find some discrepancies. Thus the special directions of treating atactic and adynamic cases do not harmonize with the general directions for treating the degenerated cases: there being some discrepancy regarding the temperature and the duration of the baths, and likewise the directions for the treatment of the lung complications do not harmonize with the general rule. A second difficulty is, that the directions are not specific enough to meet all cases which we may find. Considering the great variety of cases and conditions and the different constellation of symptoms that must occur par excellence in this class of cases, it cannot be expected that in the short number of years that the water treatment has been employed, that in this matter, full and final rules should be established, which would meet every case coming under observation. Thus during the last few years I met a few cases, which I had not the opportunity to treat with water, and the treatment of which I do not see described in the writings of Brand or Tripier and Bouveret. They were cases which to put the matter in short language, had forgotten to get better; they fitted in none of the classes of the preceeding paragraphs; none of the complications were present and none of

the symptoms were extremely severe. Yet they died.

Nevertheless there are a few extremely valuable rules, followed by Brand as well as Tripiér and Bouveret. and these are (1.) *that the longer the fever has lasted the less resistance it offers to the cooling process—hence baths both cool and long (fifteen minutes) will not often be indicated.* (2.) *The stimulating action of the water and not so much the cooling is what is indicated here, hence shorter baths, the luke-warm half-bath, with affusions, the Ziemssen bath, short cool baths (perhaps) are to be used.* (3) *The patient must be watched closely, the effect of the baths studied and any necessary change made; and in giving the first bath one must keep on the safe side.* After it has been shown how the organism reacts, more energetic means can be used.

Keeping these rules in mind, studying the cases in Chapter IV, and reading repeatedly the foregoing paragraphs, so that one will enter into the spirit of the method will certainly be of a great deal of aid to manage these difficult cases.

#### DIET, HYGIENE, MEDICATION.

The regimen as far as *diet* is concerned does not differ from that employed under any other way of treatment, expectative or medicinal. During the acme of the disease liquid nourishment, only coffee, tea, broth, milk, a cup at a

time are to be given. The advantage of the hydiatic treatment is that the patient is able to take and digest the nourishment which the books demand that he should. It is important to keep in mind that the best time for the feeding of the patient is about fifteen minutes after he has left his bath, when he begins to feel comfortable and ready to go to sleep. During the period of defervescence the broth may be made more nutritious by the addition of the yolk of an egg by boiling it with barley, farnia, rice etc. (straining it of course.)

Three to four days after the disappearance of the fever more solid food is allowed, bread and butter, mashed potatoes, light meats—but in this matter the hydiatic method has no particular advice to offer.

It is very important that the patient should *drink* much. *Brand* advises his nurses to offer, in case that the patient does not sleep, the patients some drink every 15 minutes. *T. and B.* always have the patient drink a glass of water during the bath. *Vogl* has them take in the middle of the bath and towards the end wine, tea, punch; 500—1000 c c. of French wine (1—2 pints) or 100—150 grms, (3—5 ounces) of whiskey, if stimulants are indicated, can be used per day. *T. and B.* say that some of their patients have taken 2—3 litres (2—3 quarts nearly) of

water or other drink, as lemonade, Selters-water wine-and-water. Liberal drinking will produce an abundant flow of urine, which is desirable, as in this way, as it seems, noxious matters are rinsed, so to say, out of the system. The fluids which are offered to the patient ought as a rule, to be cold.

Fresh air is necessary and a large quiet room is desirable. *Vogl* treats his cases in a frame building abundantly supplied with windows and has constantly some of the windows open even in the winter time, so that at times the temperature in the pavilion is near the freezing point. This seems to aid the cool baths, but must be very unpleasant to the attending nurses and physicians. It certainly seems to be beneficial to his patients.

The evacuations are either burned or disinfected.

The nurse ought to keep a record of all the measurements of the temperature and should note the amount of urine secreted in 24 hours.

*Are medicines to be given?* No medicines should be given that are intended to act as substitutes for the bath, such as the modern antipyretics, antipyrin, antifeloni, phenacetine, sodum salicylate etc. If they are given in strong doses they produce a condition of the system, which cannot always be looked upon without

apprehension, they merely cover up in my opinion, the real danger, they have not the beneficial effect on the pulse, digestive and urinary functions, the depression of temperature is followed by a more intense rise, the system very soon becomes accustomed to their influence, and what is perhaps their worst draw-back, they interfere with the systematic administration of the baths and the patient is debarred from the good effect of these. As a matter of fact, under their systematic use in Berlin the mortality was 24 per cent, as high as under expectant treatment if not higher.

Quinine will ordinarily perhaps do not much harm and do not much good, excepting in the later stages, but should not be omitted in malarial regions.

The mineral acids certainly do not interfere with the water-treatment, nor do the opiates, bismuth, ergot and turpentine. I certainly should not discard them. Calomel is a remedy which may be useful at times. *Vogl* however declines to use it as a routine practice.

#### RESUME.

1. The general formula is: a bath of 20°C (68°F.) every three hours, night and day when the temperature of the patient is 39°C. (102,2°F.) in the rectum. Affusions and compresses.



2. Bathe your patients from the beginning.

3. Bathe as many cases as possible.

4. The cold full bath is the most useful, convenient and generally adaptable form of the application of water, at the same time stimulating and cooling; the tepid full bath with affusions, the most pleasant, the tepid half-bath with cold affusions, the stimulating bath par excellence, the *Ziemssen* bath, the mildest form.

5. Remember that the action of the cool bath consists not only in the reduction of the temperature, but that the stimulating, protective, prophylactic effect is of no less importance.

6. Watch the effect of the baths in the first days and modify the treatment accordingly. In severe cases with high fever the baths must be given colder, or oftener, or must be of longer duration.

7. Remember that in the later stages of the disease the resistance to the baths is less than in the beginning, so that the milder measures now are indicated: a *short* cold bath. *Ziemssen's* bath, the warm half bath with cold affusions.

8. In the later stage watch the pulse, and be liberal in the use of alcohol.

9. Children bear well a short but cool bath. For persons advanced in years the Ziemssen method generally is applicable.

10. Pregnancy, the puerperal state, obesity, heart disease, phthisis, pneumonia, bronchitis are no contra indications.

11. The only absolute contra indications are, perforation peritonitis, thrombosis, intestinal hemorrhage, severe enough to lower the temperature and pulse.

12. No harm is done to bathe fever cases even if the diagnosis of typhoid-fever is not certain.

13. See that your patients take a good deal of drink.

14. The best time to nourish the patient is 15—30 minutes after the bath.

15. In mild case the method is not useless but will produce more comfort than any other remedy.

16. Inform your patients and their friends beforehand about the physiological effects of the bath, that they will not feel alarmed about the shivering, the cold hands and feet, the impalpable pulse etc.

17. If possible be present at the first cold bath to awake confidence in the patients and the attendants.

IMPORTANT ADVICE.

1. Introducing the method in a community select a case which will surely get well, that is let it be a case which you can treat from the beginning. and where the method will be carried out accurately, so that a valuable method do not come into discredit.

2. *“If you will follow my advice you will [at first] only treat cases which come under treatment in the beginning of the disease; after having become well acquainted with the effects of the bath, both the antipyretic and the stimulating;—venture to take hold of the critical ones of a later stage.”* (From a private letter from Dr. Brand.)

## CHAPTER IV.

### Illustrative Cases.

When I began using the hydriatic method I felt the want of having read a detailed description of a number of cases. Nothing will in my opinion make up for the want of personal clinical experience so well as accurately described cases. I have selected therefore from the writings of *Tripier and Bouveret* and of *Brand* a number of such cases, mild ones and severe ones, some requiring many, some few baths, cases presenting a variety of complications and cases surrounded with difficulties. I think that after having read such cases one will proceed in ones' work with more confidence and less worry, and I hope I have in this respect met the wishes of the indulgent reader. The first five cases are from *Tripier and Bouveret* the remainder from *Brand*. Some of these cases are described in such detail—each measurement of the temperature and each bath being noted down—that these may be taken as a guide for the execution of the method.

Other cases will give directions how to act when complications and symptoms of unusual

gravity are present, and still others are inserted to encourage those who may meet apparently insurmountable difficulties.

**Case I.** LEONTINE, W., 16 years of age, received into the Hotel Dieu August 25th 1885. Mother, a brother and sister also sick with typhoid, another brother has died from same disease a few days ago. She always had been healthy. Menstruation showed itself at 15 aet. without pain. The illness began August 23rd when patient had a chill and a headache, lost her appetite and had to go to bed.

*August 28th*, on the day of her admission (6th day of illness: No grave nervous disturbances, no stupor, no delirium, but considerable weakness, high fever, T. 40,7; P. 120, regular, complete loss of appetite, tongue red on edges and on point, dry, with some aphthous ulcers, diarrhoea 4—5 times daily, abdomen soft, little painful, horborgymi, nose-bleeding absent, no roseolae, heart and lungs normal. She patient was bathed at once after the ordinary formula. The first bath at 4 p.m., until midnight. the following temperatures were found.

Before the bath(18°)	40,2,	after the Bath	39,8
“ “ “	40,6,	“ “ “	39,9
“ “ “	40,7,	“ “ “	39,8

*August 29th.* The reductions after the bath are quite marked, the maxima however remain very high. From 10 a. m. on the T. of the bath is reduced to 16°.

FORENOON.

AFTERNOON.

B. B. 40,8, A. B. 39,9	B. B. 40,8, A. B. 39,4
“ “ 40,3, “ “ 39,8	“ “ 40,4, “ “ 39,2
“ “ 39,9, “ “ 39,3	“ “ 40,7, “ “ 39,5
(16°) 40,2, “ “ 39,8	“ “ 40,6, “ “ 39,7

*August 30th.* Diarrhoea not yet diminished; 2—3 evacuations, even during baths. Baths of 16° to be continued but to be given every 2½ hours.



FORENOON.

B. B. 40,6, A. B. 39,5
“ “ 40,4, “ “ 39,6
“ “ 40,2, “ “ 39,2
“ “ 40,1, “ “ 39,3
“ “ 40,6, “ “ 30,5

AFTERNOON.

B. B. 40,5, A. B. 39,2
“ “ 40,3, “ “ 39,9
“ “ 40,6, “ “ 39,8
“ “ 40,1, “ “ 38,2
“ “ 40,7, “ “ 38,9

*August 31st.* A few roseola spots appear. Diarrhoea continues. Aphthous ulcers on tongue. Baths as yesterday.

B. B. 40,6, A. B. 38,3
“ “ 40,1, “ “ 39,0
“ “ 40,0, “ “ 38,4
“ “ 40,0, “ “ 38,9
“ “ 40,3, “ “ 38,5

B. B. 40,1, A. B. 38,3
“ “ 40,4, “ “ 38,2
“ “ 40,3, “ “ 38,6
“ “ 40,5, “ “ 38,3

*September 1st.* Diarrhoea much diminished. No dangerous symptoms. A slight hoarseness. Pharynx a little red, covered with mucus. New eruption of roseola. Treatment the same.

B. B. 40,3, A. B. 38,4
“ “ 40,0, “ “ 38,1
“ “ 40,0, “ “ 38,3
“ “ 39,3, “ “ 38,4
“ “ 40,5, “ “ 38,3

B. B. 40,4, A. B. 39,1
“ “ 40,2, “ “ 39,0
“ “ 40,7, “ “ 39,3
“ “ 40,4, “ “ 39,5
“ “ 40,5, “ “ 39,6

*September 2nd.* Condition satisfactory. No more fever. The baths produce still greater reductions, often exceeding 1°. Treatment the same.

B. B. 40,3, A. B. 39,4
“ “ 40,0, “ “ 38,7
“ “ 40,1, “ “ 38,2
“ “ 40,2, “ “ 39,0
“ “ 39,6, “ “ 38,2

B. B. 40,4, A. B. 38,5
“ “ 40,1, “ “ 39,0
“ “ 40,0, “ “ 39,2
“ “ 40,6, “ “ 39,0

*September 3rd.* In spite of the strong reductions of temperature the fever ascends rapidly after each bath. Continuation of treatment. Each bath of 16° is followed by a

chill, lasting at times an hour. Diarrhoea still more diminished. Hoarseness almost disappeared. Some aphthæ and pain in pharynx.

B. B. 40,4, A. B. 39,2	B. B. 40,2, A. B. 38,4
“ “ 40,0, “ “ 38,7	“ “ 40,0, “ “ 39,2
“ “ 40,1, “ “ 38,2	“ “ 40,0, “ “ 38,2
“ “ 40,0, “ “ 38,4	“ “ 40,1, “ “ 38,3
“ “ 40,0, “ “ 38,9	

*September 4th.* The same satisfactory condition. Diarrhoea has almost ceased; a few cold enemata have been necessary. No other disturbed functions but the increased frequency of pulse 120. Urticaria on body. A little redness and pain in pharynx. No cough. Respiration normal, without rales. Slight pain in right shoulder. The thermic reductions amount to 1,5 and more. From 10 o'clock a. m. on baths of 18° every three hours.

B. B. 40,4, A. B. 38,5	B. B. 39,9, A. B. 37,9
“ “ 39,6, “ “ 38,3	“ “ 39,1, “ “ 37,2
“ “ 40,3, “ “ 38,8	“ “ 39,8, “ “ 37,8
“ “ 39,9, “ “ 38,1	“ “ 39,5, “ “ 38,1
(18°) 39,2, “ “ 37,8	

Not only are the reductions very large, but also the curves of the maxima sink at last down to near 39. Now begins the period of relative defervescence.

*September 5th.* Status idem. The maximum a little higher than 39°. Baths of 20° from now on.

B. B. 39,2, A. B. 37,9	B. B. 39,0, A. B. 38,1
“ “ 39,1, “ “ 37,6	“ “ 39,3, “ “ 38,0
“ “ 39,9, “ “ 37,8	“ “ 39,5, “ “ 37,8
(20°) 39,5, “ “ 38,0	“ “ 39,1, “ “ 38,3

*September 6th.* Status idem

B. B. 39,4, A. B. 38,5	B. B. 39,3, A. B. 37,9
" " 38,5, " " 38,1	" " 39,1, " " 38,0
" " 39,3, " " 37,4	" " 39,5, " " 38,1
" " 38,9, " " 38,0	" " 39,4, " " 37,8

*September 7th.* As yesterday the maxima are at times below 39°. Nevertheless the patient gets a bath when the T. reaches or exceeds 38,5°.

B. B. 38,9, A. B. 37,6	B. B. 38,6, A. B. 37,8
" " 39,6, " " 37,8	" " 38,8, " " 37,9
" " 39,3, " " 38,1	" " 39,2, " " 37,5
" " 39,0, " " 38,1	" " 38,7, " " 37,3

*September 8th.* Patient is constipated several days. Cold enemata. For several days sleep in the intervals between the baths. Urine abundant, colorless—no albumen. The thermic reductions being pronounced and the maxima below 39 the duration of bath is shortened to 10 minutes.

B. B. 38,6, A. B. 37,0	B. B. 38,7, A. B. 37,5
" " 38,5, " " 37,6	" " 38,8, " " 37,6
" " 38,8, " " 37,8	" " 38,7, " " 37,4
" " 38,9, " " 37,6	" " 39,1, " " 37,9

*September 9th.* The first bath skipped at 4 a. m.

B. B. 39,0, A. B. 37,8	B. B. 38,8, A. B. 38,2
" " 38,4, " " —	" " 39,2, " " 38,2
" " 39,5, " " 38,1	" " 39,0, " " 37,7
" " 39,3, " " 38,2	" " 38,8, " " 37,5

After the omission of the first bath, the temp. experienced a certain elevation, as is often the case; it rose to 39,5, which, at least in the morning, it had not done for several days.

*September 10th.* Two baths omitted.

B. B. 38,7, A. B. 37,8	B. B. 39,5, A. B. 37,3
" " 39,1, " " 38,0	" " 38,8, " " —
" " 38,6, " " 37,7	" " 39,4, " " 38,3
" " 38,5, " " —	" " 39,3, " " 37,8

*September 11th.* Cough since two days. Moist rales over basis of lung. Some hoarseness, and dryness in pharynx. Patient always sleeps well.

B. B. 38,4, A. B. —	B. B. 39,8, A. B. 37,9
" " 39,2, " " 37,7	" " 38,4, " " —
39,1, " " 37,8	" " 40,2, " " 38,2
38,5, " " —	" " 39,5, " " 39,3

*September 12th.* From 10 a. m. on the duration of the baths is reduced to five minutes- In this advanced stage very short baths reduce the temperature as well as longer ones.

B. B. 38,2, A. B. —	B. B. 39,3, A. B. 37,6
" " 38,8, " " —	" " 39,2, " " 37,8
39,5, " " 37,9	" " 38,8, " " —
" " 38,9, " " —	" " 39,7, " " 37,8

*September 13th.* Slight changes during day-time. Temp. maxima often exceed 39°. Complications absent.

B. B. 38,4, A. B. —	B. B. 39,8, A. B. 37,9
" " 39,2, " " 37,5	" " 39,6, " " 37,8
" " 39,1, " " 37,4	" " 39,3, " " 37,5
" " 38,8, " " —	" " 39,2, " " 37,2

*September 14.*

B. B. 38,8, A. B. —	B. B. 39,9, A. B. 37,8
" " 39,9, " " 38,2	" " 39,5, " " 37,6
" " 39,5, " " 37,3	" " 38,8, " " —
" " 38,2, " " —	" " 40,0, " " 38,0

*September 15th.* Marked improvement. Hoarseness almost gone. Patient complains of severe pain in extremities after bath, especially in feet.

B. B. 38,6, A. B. —  
 " " 38,9, " " —  
 " " 39,5, " " 37,7  
 " " 39,1, " " 37,6

B. B. 39,3, A. B. 37,4  
 " " 39,7, " " —  
 " " 39,4, " " 37,6  
 " " 39,8, " " 38,0

*September 16th.*

B. B. 39,2, A. B. 37,5  
 " " 38,8, " " —  
 " " 38,5, " " —  
 " " 39,8, " " 37,2

B. B. 38,8, A. B. —  
 " " 39,1, " " 37,2  
 " " 39,4, " " 37,8  
 " " 38,5, " " —

*September 17th.*

B. B. 39,3, A. B. 38,0  
 " " 38,1, " " —  
 " " 38,6, " " —  
 " " 39,3, " " 38,2

B. B. 38,9, A. B. —  
 " " 39,5, " " 38,5  
 " " 39,3, " " 38,0  
 " " 38,6, " " —

*September 18th.*

B. B. 39,5, A. B. 37,8  
 " " 38,8, " " —  
 " " 33,9, " " —  
 " " 38,7, " " —

B. B. 39,0, A. B. —  
 " " 39,1, " " 37,3  
 " " 38,5, " " —  
 " " 38,9, " " —

*September 19th.*

B. B. 38,7, A. B. —  
 " " 39,4, " " 37,0  
 " " 37,8, " " —  
 " " 39,0, " " —

B. B. 38,9, A. B. —  
 " " 39,2, " " 37,2  
 " " 38,8, " " —  
 " " 39,0, " " —

*September 20th.*

B. B. 38,3, A. B. —  
 " " 38,8, " " —  
 " " 38,6, " " —  
 " " 38,5, " " —

B. B. 39,0, A. B. —  
 " " 39,9, " " 37,5  
 " " 38,3, " " —  
 " " 38,6, " " —



To-day the patient is bathed for the last time. The treatment required 151 baths. The general condition is excellent. The strength of the patient is preserved. For some days the appetite is acute. Tongue clean bright rose red —moist. Four cold enemata daily. Temp. sinks more and more. Since last night defervescence very marked.

*September 21st.* 38,9—38,5—38,2—38,0—38,3—38,7  
—38,5—38,6.

*September 22nd.* 38,5—37,8—37,7—38,0—38,4—38,3  
—38,5—38,6.

*September 23rd.* 38,6—38,3—38,9—37,9—38,2—38,5  
—38,7—38,4.

*September 24th.* 38,0—38,7—37,6—38,2—37,9—38,1  
—38,6—38,5.

*September 25th.* 38,3—38,0—37,6—38,0—38,4—37,9  
—38,3—38,2.

*September 26th.* 37,9—38,0—37,5—38,2—38,5.

*September 27th.* 37,5—38,2.

*September 28th.* 37,5.

From now on the morning temp. is normal. Up to October 7th it ran at times to over 38 in the evening. Patient leaves the hospital October 11th fully recovered desirous of attending to her former occupation.

This case plainly belongs to grave cases. The course it took was simple and regular, presenting no complication since the treatment was begun on the 6th day. Diarrhoea severe in the beginning soon disappeared and was followed by constipation.

We recognize the three periods without difficulty. From August 24th to September 4th

period of combat with the fever. The maxima remain in the neighborhood of 40° degrees and form a straight line. To vanquish the fever it was necessary to reduce the temperature of the baths to 16°. From September 15—19 period of relative apyrexia. September 20th the period of defervescence begins. The duration of the fever—counting up to the day when the temp. reaches 37,5 was 43 days. But reconvalescence took a rapid course. The patient was in the hospital only 47 days, and leaving it felt so well that she thought herself strong enough to take up her old occupation. (151 baths were given.S.)

**Case II.** HENRIETTE M. 36 aet. Admitted into Hotel Dieu August 25th, never seriously sick before. Menstruation regular since 20 years of age. Had been dismissed from hospital August 14 as cured, where she had been treated for lumbago. Until August 22nd she felt well, after which she experienced some lassitude. August 22nd repeated chills, headache, tinnitus aurium, vomited 3—4 times bilious matter—loss of appetite.

Upon her admission August 25th, high fever, T. 40,4, P. 114. Tongue red and dry; complete loss of appetite. Constipation since three days. Abdomen somewhat tympanitic. 3—4 roseola spots on same, making it probable that the disease began before August 22nd. Heart and lungs normal. Urine free from albumen. Restless at night. Sleep wanting.

Patient is bathed from the first days of her stay in the hospital: a bath every three hours of 15 minutes duration and 20° temp.

Before the bath	40,4,	after the bath	39,8
“ “ “	39,9,	“ “ “	39,5
“ “ “	40,2,	“ “ “	39,8

*August 26th.* Menstruation which appeared on time, but which had been interrupted when patient was admitted. shows itself during first bath.

B. B. 39,8,	A. B. 39,4	B. B. 39,6,	A. B. 39,1
“ “ 39,9,	“ “ 39,2	“ “ 40,0,	“ “ 39,4
“ “ 39,7,	“ “ 38,8	“ “ 39,9,	“ “ 39,3
“ “ 39,4,	“ “ 38,9	“ “ 40,1,	“ “ 39,4

*August 27th.* Menstruation flows but moderately yesterday. General condition to-day excellent. Some diarrhoea (4 passages.) Five more roseola spots.

B. B. 39,7,	A. B. 38,5	B. B. 39,3,	A. B. 38,0
“ “ 39,5,	“ “ 38,4	“ “ 39,8,	“ “ 38,7
“ “ 39,2,	“ “ 38,1	“ “ 39,5,	“ “ 38,6
“ “ 39,1,	“ “ 38,2	“ “ 40,0,	“ “ 39,1

*August 28th.* Improvement continues. Tongue moist, rose colored. Polynria; no albumen in urine. The lassitude of the limbs has disappeared.

B. B. 39,8,	A. B. 38,7	B. B. 39,2,	A. B. 38,4
“ “ 40,0,	“ “ 38,6	“ “ 40,2,	“ “ 39,5
“ “ 40,3,	“ “ 39,2	“ “ 39,6,	“ “ 38,4
“ “ 39,3,	“ “ 38,5	“ “ 39,7,	“ “ 38,6

*August 29th.* The same satisfactory condition. A little pain in right iliac fossa. Sleep between baths. Pulse less frequent.

B. B. 40,2,	A. B. 39,2	B. B. 40,2,	A. B. 39,0
“ “ 39,4,	“ “ 38,9	“ “ 39,4,	“ “ 38,4
“ “ 39,3,	“ “ 38,8	“ “ 40,3,	“ “ 38,5
“ “ 39,2,	“ “ 38,2	“ “ 40,2,	“ “ 38,8

*August 30th.* There is no other symptom left but the fever.

B. B. 40,1, A. B. 38,6	B. B. 39,9, A. B. 38,2
" " 39,8, " " 38,5	" " 39,8, " " 39,0
" " 39,8, " " 39,2	" " 39,9, " " 38,9
" " 39,3, " " 38,4	" " 40,1, " " 38,7

*August 31st.*

B. B. 39,6, A. B. 38,2	B. B. 39,9, A. B. 38,1
" " 39,2, " " 37,8	" " 39,6, " " 38,3
" " 39,1, " " 38,2	" " 39,8, " " 38,5
" " 39,6, " " 38,3	" " 39,7, " " 38,4

*September 1st.* The combat with the fever is finished. The maxima sink, on the average they do not exceed 39 much.

B. B. 39,4, A. B. 38,2	B. B. 39,2, A. B. 38,5
" " 39,5, " " 38,1	" " 39,4, " " 38,1
" " 38,7, " " 38,0	" " 39,0, " " 38,5
" " 39,1, " " 39,1	" " 39,4, " " 38,0

*September 2nd.* Defervescence is beginning. Not only are the thermic reductions large, there is also no marked tendency for the fever to get back to the old temperature. No symptom but the fever. The patient omits two baths.

B. B. 38,9, A. B. 38,3	B. B. 39,2, A. B. 38,8
" " 38,5, " " 37,8	" " 38,5, " " —
" " 38,0, " " —	" " 39,4, " " 38,2
" " 39,6, " " 39,0	" " 39,3, " " 38,0

After each omitted bath the temperature rises. These elevations are of no importance inasmuch as the following bath produces marked reduction in spite of this fact.

*September 3rd.* One bath omitted. Condition as satisfactory as possible. No other symptom but high pulse and temperature. No coughs, no rales.

B. B. 39,7, A. B. 38,1	B. B. 38,7, A. B. 38,0
" " 38,7, " " 38,0	" " 39,0, " " 38,2
" " 38,2, " " —	" " 38,1, " " 28,0
" " 36,6, " " 38,5	" " 39,2, " " 38,4

*September 4th.*

B. B. 38,3, A. B. —	B. B. 39,8, A. B. 38,2
" " 39,5, " " 38,5	" " 38,8, " " 38,1
" " 38,5, " " —	" " 38,3, " " —
" " 38,4, " " —	" " 39,1, " " 38,0

The temperature has evidently a tendency to rise after the omitted baths, thus it rose to 39,8, higher than for two previous days, upon the successive skipping of two baths.

*September 5th.*

B. B. 38,9, A. B. 37,5	B. B. 38,8, A. B. —
" " 38,0, " " —	" " 39,0, " " —
" " 38,5, " " —	" " 39,2, " " 37,3
" " 38,9, " " —	" " 38,3, " " —

*September 6th.*

B. B. 39,0, A. B. —	B. B. 39,6, A. B. 37,8
" " 39,5, " " 38,4	" " 38,1, " " —
" " 38,1, " " —	" " 38,0, " " —
" " 38,5, " " —	" " 38,7, " " —

The two baths of this day were the last ones. The whole treatment required 80 baths in all. From now on 3—4 cold enemata daily.

*September 7th.* 38,6—38,2—38,5—38,3—38,4—38,3  
38,6—38,2.

*September 8th.* 38,1—37,9—38,0—37,9—38,4—38,0  
37,9—38,1.

Condition excellent, Strength well preserved—appetite active, Evacuations only after quinine enemata.



*September 9th.* 38,0—8,32—37,8—38,7—38,7.

*September 10th.* The present day is the beginning of complete apyrexia. Temp. taken twice a day for a week always below 38°.

*September 14th.* Patient is determined to leave the hospital, which she does in excellent condition, her convalescence being far advanced.

Roseola being present on the day of her admission it is probable that August 25th was the 7th and not the 5th day of her sickness, according to patients statement. Fever lasted 23 days, her stay in the hospital 27 days. On her departure, when the fever had only left her 5 days, she was well advanced towards complete recovery, which must have been perfect very soon. The combat with the fever lasted from August 25th to September 1st, about eight days. Defervescence which set in slowly lasted (as is customary in cases of medium gravity) 15 days. This case is to be looked upon as a typical case of typhoid fever, treated after Brand. (80 baths were given. S.)

**CASE III.** JOHN W., 22 aet, admitted September 8th to the Hotel Dieu. No hereditary disease. Scrophulous affection, swollen lymphatic glands of neck when a child. Small-pox at 12 years.

*August 30th.* Beginning of sickness with repeated chills, feeling of lassitude and headache.

*September 8th.* The day of admission is the 10th day of sickness. T. 39,5, P. 116. Patient is rather weak, but not restless, Tongue coated, somewhat dry. Complete

loss of appetite. Abdomen moderately tender; ileocaecal borborygmi. Diarrhoea four times daily. Roseola on abdomen. Headache has ceased, after a nose-bleed five days ago. Heart and lungs normal. No albumen in urine. Patient is bathed immediately after his admission. First bath in the afternoon.

Before the bath	39,5,	after the bath	39,2
" "	" 39,5,	" "	" 39,3
" "	" 40,2,	" "	" 40,0
" "	" 40,3,	" "	" 40,0
" "	" 40,0,	" "	" 39,8

*September 9th.* Lassitude diminished—baths are well borne. The ordinary formula proves sufficient.

B. B. 39,4,	A. B. 38,9	B. B. 39,6,	A. B. 39,4
" " 39,0,	" " 38,6	" " 39,6,	" " 39,4
" " 39,4,	" " 39,1	" " 40,1,	" " 39,7
" " 39,7,	" " 39,4	" " 40,0,	" " 39,7

*September 10th.*

B. B. 39,6,	A. B. 39,2	B. B. 39,5,	A. B. 39,5
" " 39,3,	" " 39,0	" " 40,0,	" " 39,5
" " 39,4,	" " 39,2	" " 39,9,	" " 39,4
" " 39,8,	" " 39,4	" " 39,7,	" " 39,4

*September 11th.* Tongue a little dry. General condition very satisfactory.

B. B. 39,4,	A. B. 39,0	B. B. 39,7,	A. B. 39,2
" " 39,3,	" " 39,0	" " 39,8,	" " 39,2
" " 39,2,	" " 38,7	" " 39,6,	" " 39,1
" " 39,3,	" " 38,8	" " 39,5,	" " 39,1

*September 12th.* Diarrhoea much diminished, 2—3 fresh roseolae. Only the fever remains.

B. B. 39,3, A. B. 38,8	B. B. 39,3, A. B. 38,7
" " 39,0, " " 38,5	" " 39,6, " " 38,9
" " 39,1, " " 38,6	" " 39,4, " " 38,7
" " 39,1, " " 38,5	" " 39,0, " " 38,3

Patient might have skipped two baths, but is ordered to continue them even if the temp. is between 38,5 and 39.

*September 13th.* Great improvement. Diarrhoea increased. Two baths omitted, temp, not reaching 38,5.

B. B. 38,7, A. B. 38,0	B. B. 39,2, A. B. 38,1
" " 38,4, " " —	" " 39,1, " " 37,8
" " 38,8, " " 38,1	" " 38,8, " " 38,0
" " 38,3, " " —	" " 38,7, " " 37,8

Temp. increased upon omission of baths, but not as much as in cases of medium gravity.

*September 14th.* General condition excellent. Strength has returned. Patient continues omitting baths.

B. B. 39,3, A. B. —	B. B. 39,3, A. B. 38,6
" " 39,0, " " 37,8	" " 38,9, " " 38,2
" " 38,1, " " —	" " 38,3, " " —
" " 38,4, " " —	" " 39,1, " " 38,4

*September 15th.*

B. B. 37,7, A. B. —	B. B. 39,0, A. B. 38,3
" " 38,3, " " —	" " 38,4, " " —
" " 38,8, " " 38,0	" " 38,9, " " 38,2
" " 38,3, " " —	" " 38,3, " " —

*September 16th* Patient receives but one more bath. The whole treatment having required 50 baths.

B. B. 38,2, A. B. —	B. B. 38,7, A. B. —
" " 38,4, " " —	" " 39,2, " " —
" " 38,3, " " —	" " 39,3, " " 38,3
" " 38,5, " " —	" " 37,9, " " —

*September 17th.* 38,6—38,5—83,5—38,6—8,73—38,9 :  
38,7—38,9.

Appetite lebhaft. Patient asks for food.

*September 18th.* 38,2—37,8—38,1—39,0.

*September 19th.* 38,2—39,0.

*September 20th.* 37,6—38,7.

*September 21st.* 37,8—38,3.

*September 22nd.* 37,0—37,8. From now on to September 28th the temp. does not reach 38,0 in the evening, hence complete apyrexia.

*September 28th.* Patient leaves hospital in excellent condition.

In this case there is no stage of reconvalescence. This case lasted only 23 days. Patient remained in hospital 20 days. There was no combat with fever, defervescence beginning on first day of treatment. Still the fever resisted somewhat the refrigeration. The great majority of the mild cases has a more rapid course and defervescence is more prompt. This case can be looked upon as one between the mild form and those of medium gravity. (50 baths were given S.)

**Case IV.** June 30th 1884. DR. X. 34 aet, a strong man of healthy constitution, felt very unwell, he had been attending typhoid fever cases the previous days. Chill, loss of appetite, fever and general malaize. These symptoms are present all of the following day, towards evening increase of fever, further loss of strength.

*July 2nd.* Status idem or rather an increase of severity of symptoms.

*July 3rd.* Patient convinced of having typhoid fever and alarmed by the intensity of the initial symptoms, has himself

admitted as a private patient into the Hotel Dieu. Headache very severe; no photophobia. Pulse regular 112. Meteorism and diarrhoea are wanting also borborygmi, T. 40,7. Patient has not quite reached the third day of sickness. Diagnosis of typhoid fever not certain but probable. *Patient himself demands the treatment according to Brand.* The first bath is given 10 o'clock p. m. (20°, 15 minutes duration.) It is borne well, produces however only a very moderate reduction. T. 15 minutes later 40,6. The ordinary Brand treatment is decided upon, as though the diagnosis were absolutely certain.

*July 4th.* The fever is very high and resists refrigeration. The morning baths produce no deeper remission than the evening baths. Before and after the bath the temp. is always above 40. The 16 thermometric conditions for the day are the following.

1 a.m. B. B. 40,5, A. B. 40,3	B. B. 40,5, A. B. 40,0
“ “ 40,3, “ “ 40,1	“ “ 40,7, “ “ 40,2
“ “ 40,3, “ “ 40,1	“ “ 40,8, “ “ 40,4
“ “ 40,6, “ “ 40,1	“ “ 40,5, “ “ 40,1

The condition of the patient has not changed since yesterday. He coughs. Numerous sonorous rales over chest.

*July 5th.* Fever still resists the cooling process. The Temp. of the baths are to be from 10 a. m. on lowered to 18°. The remissions are hardly more noticeable than before.

B. B. 40,3, A. B. 40,0	B. B. 40,5, A. B. 39,9
“ “ 40,4, “ “ 40,1	“ “ 40,5, “ “ 40,0
(18°) 40,2, “ “ 40,0	“ “ 40,6, “ “ 40,1
“ “ 40,7, “ “ 40,1	“ “ 40,5, “ “ 40,1

Headache very annoying. Abdominal symptoms absolutely absent, no tympanites, no diarrhoea. Swallowing difficult, nothing but a redening of the pharynx



to be detected. Continuous cough. Numerous sonorous rales. Baths of  $18^{\circ}$  are continued.

*July 6th.* The battle with the fever persists. The temp. before the bath on this day is still above  $40^{\circ}$ , after the bath it sinks to  $39,7$  once only.

B. B. 40,4, A. B. 40,0	B. B. 40,2, A. B. 39,9
" " 40,3, " " 39,9	" " 40,5, " " 40,1
" " 40,5, " " 40,1	" " 40,3, " " 39,8
" " 40,4, " " 40,0	" " 40,2, " " 39,7

Great diminuation of strength. The patient seems to be astonished over such an intense typhoid infection. Some delirium at night. Headache always severe, about which patient complains a good deal. Cough more plentiful and harrassing. Mucous purulent, thick, glassy expectoration, at times bloody. Auscultation reveals numerous sonorous rales mingled with crackling rales on right side. Dyspnoea more intense, face somewhat cyanotic. P. 112.

*July 7th.* The same resistance of the fever. In spite of the baths of  $18^{\circ}$  the temp. still remains above  $40^{\circ}$ . The remissions are not more marked than previously.

B. B. 40,4, A. B. 40,0	B. B. 40,5, A. B. 39,9
" " 40,0, " " 39,7	" " 40,4, " " 40,0
" " 40,3, " " 39,9	" " 40,3, " " 39,9
" " 40,2, " " 39,8	" " 40,5, " " 40,0

Status idem. Abnormal symptoms still absent.

*July 8th.* The same resistance of the fever during the night, from 10 a. m. on the temp. of the baths is to be  $15^{\circ}$ .

These baths are not well borne by [not pleasant to] the patient but the remissions are more marked after the first bath of this kind.

B. B. 40,3, A. B. 39,8	B. B. 39,9, A. B. 39,2
" " 40,4, " " 40,0	" " 40,3, " " 39,5
" " 40,0, " " 39,9	" " 40,0, " " 39,2
( $15^{\circ}$ ) 40,0, " " 39,1	" " 40,1, " " 39,5

Status idem. Baths of 15° continued.

*July 9th.* The baths are evidently more effectual, without having any unfavorable change in the chest symptoms, the temp. sinks considerably, it has even gone down to 39,3 several times before the bath. While in the previous days they always remained at the same height before the bath, without a trace of remission, we observe to-day for the first time an obvious unmistakable morning remission.

B. B. 39,9, A. B. 39,5	B. B. 39,5, A. B. 39,1
" " 39,4, " " 39,0	" " 39,4, " " 39,0
" " 39,6, " " 38,9	(20°) 39,7, " " 39,2
" " 39,3, " " 38,8	" " 40,0, " " 39,3

A marked improvement, so that the condition of the patient no more calls forth any apprehension. The previous severe headache is much diminished. No abdominal symptoms, no roseola.

*July 10th.* The decrease of the fever and the improvement of the general condition induce us to increase the temp. of the baths especially as those of 15° are very unpleasant to the patient. Yesterday 10 p. m. a bath of 20 was given as well as throughout July 10th excepting at 11 p. m. That the fever has been kept down only by the energetic and continuous cold-water treatment is more evident by the fact that coincidentally with the baths of 20° on July 10th the fever increased again, so that we are forced to return to baths of 15° at 11 p. m.

B. B. 38,3, A. B. 38,9(20)	B. B. 39,4, A. B. 38,9
" " 39,5, " " 39,0	" " 40,4, " " 39,5
" " 39,3, " " 39,1	" " 40,6, " " 40,0
" " 40,0, " " 39,3	(15°) 40,2, " " 39,7

In spite of the increase in the fever the general condition has not become worse.

*July 11th.* Temp. in the morning still very high; in the evening there is evidently a tendency for it to go down. Inasmuch as the baths of 15° are burdensome to the patient, their temp. is raised to 18° from 8 p. m. on.

B. B. 40,1, A. B. 39,6	B. B. 39,5, A. B. 39,0
" " 40,0, " " 39,5	" " 39,5, " " 38,6
" " 40,2, " " 39,7	(18°) 39,4, " " 38,8
" " 39,8, " " 39,3	" " 39,8, " " 38,7

With the rise of the temp. the headache has returned. P. 104. No abnormal symptoms. Continuous cough expectoration still bloody, tenacious and slightly tinged with blood.

*July 12th.* The temp. falls again, more than first time, always below 40° before the bath. Baths 18°.

B. B. 39,7, A. B. 39,0	B. B. 39,3, A. B. 38,8
" " 39,4, " " 38,7	" " 39,8, " " 39,1
" " 39,2, " " 38,8	" " 39,3, " " 38,7
" " 39,4, " " 38,9	" " 39,1, " " 38,6

General condition improving. Some thrush and uvula and veta palati.

*July 13th.* Temp. sinks slowly but steadily once even below 39°. From 8 a. m. on baths of 20°.

B. B. 39,3, A. B. 38,7	B. B. 38,9, A. B. 38,4
" " 39,2, " " 38,6	" " 39,4, " " 38,8
(20°) 39,2, " " 38,6	" " 39,6, " " 39,0
" " 39,0, " " 38,5	" " 39,2, " " 38,7

General condition better. Abdominal symptoms absent.

*July 14th.* Fever continues its descent slowly but regularly.

B. B. 39,0, A. B. 38,6	B. B. 39,9, A. B. 38,6
" " 39,0, " " 38,8	" " 39,7, " " 38,5
" " 38,6, " " 38,2	" " 39,0, " " 38,5
" " 39,0, " " 37,2	" " 39,0, " " 38,4

Coughs and expectorations present; the latter mucous without admixture of blood.

*July 15th.* Defervescence completed more and more. Temp. in the morning over 38,5 are less in the evening, allowing the first omission of baths. Patient only receives three more baths.

B. B. 38,8, A. B. 38,2	B. B. 38,4, A. B. —
" " 38,6, " " 38,1	" " 38,7, " " 38,4
" " 38,3, " " —	" " 38,3, " " —
" " 38,5, " " —	" " 38,5, " " —

*July 16th.* On this day the fever has ceased. Temp. once only at 38° No. more baths. 37,6—37,37—7,8—33,5—37,8—37,9—37,9—37,5.

General condition excellent. Reconvalence begins to-day. No return of fever as shown by thermometric notations.

Mr. X. remained weak for some time, but his reconvalence progressed rapidly.

This was an incomplete typhoid. The abnormal symptoms of so much importance for diagnosis were wanting. No tympanites, diarrhoea nor roseolae were noted. That the disease was nevertheless typhoid can be proven by the fact that four persons, who had taken care of Dr. X. of whom two had not come in contact with any other patient, were infected from him. These had, when his reconvalence began, typhoid fever in a typical form.

**Case V:** MARIE M. 32 aet, house keeper, admitted into Hotel Dieu September 9th 1881. Parents tuberculous. Onset of sickness sudden August 18th with severe headache and tinnitus aurium. Neither nose bleeding no abdominal pain. One evacuation daily, but fluid. Eight days later chill, after which cough and dyspnoea.

Face and extremities cyanotic, breathing frequent, noisy, combined with tracheal rales and dyspnoea so great that it was feared that patient might not live to following day. Tongue very dry. Abdomen distended but not painful. Old roseolea. No borborygmi. Hearing obtuse. Profuse foamy muco-purulent expectoration. In both lungs, particularly the left, resonant rales, *posteriorly*, behind and below loud bronchial respiration. Vocal fremitus here not diminished; bronchophony and dullness. Respiratory rales are so loud that the heart sounds cannot be heard. Patient cannot stop breathing on account of feeling of oppression. Urine free from albumen. Upon admission, 3 p. m. T: 41,2°—6 p. m. 41,1°.

Patient receives at once (22nd day) a bath; after that Temp. 39,4. Temperatures before and after bath until 10 a. m. next day: 40,9—39,5; 39,5—38,4; 39,9—39,0; 38,2—37,5. Since the first bath the dyspnoea has been greatly diminished, and the patient feels a good deal better.

*September 10th.* At the visit a marked improvement noted with decrease of temp; patient can lie down and breathe freely. Signs of pneumonia on right side still present. T. rises to 39,5 at 6 p. m. Since all other Temp. are only 38,5 and less only a cold enema is given.

*September 11th.* 10 p. m. Patient feels well although F. temp. has suddenly gone up to 40. Auscultation reveals same condition as on admission. Muco-purulent expectoration. No albumen in urine. Patient is bathed, Temp. 39—40.



*September 12th.* Temp. is falling; two baths skipped Temp. in consequence between 39 and 39,6. The redness of the cheeks is in contrast with the yellowish tinge of the face and conjunctivae. Patient answers all questions well is delirious at night Cough always present with abundant expectoration; loud bronchial respiration and numerous rales.

*September 13th.* Respiration more free in the morning; tracheal rales not any more heard at a distance as before. Bronchial respiration almost disappeared, patient is rarely heard coughing. Over base of both lungs posteriorly moist rales. Expectoration less purulent. Temp hardly exceeds 39° in the morning, while it reaches 40 and even 40,5 at night.

*September 14th.* Temp. varies later between 40,4 and 39, the latter figure predominating. Patient quiet and breathes quietly. No diarrhoea.

*September 15th.* T. 39,3—40,6.

*September 16th.* Marked reduction of T. which is frequently below 39. Two baths omitted.

*September 17th.* T. up again to 40, nevertheless improvement continues. Face regains its natural color. Patient has slept and feels better. Cough less harassing. Over base of right lung some bronchial respiration, rales plentiful on both sides. No albumen in urine.

*September 18th, 19th, 20th.* T. mostly over 39, with slight tendency to sinking. No albumen in urine

*September 21st.* One bath omitted and September 22nd two of them.

*September 23rd.* Patient receives but one bath. T. at 38 in the beginning rises to 39,4 towards evening sinks 39.

*September 24th.* T. rises to 40 evenings, baths renewed, after that reduction of T. Auscultation reveals

the same conditions with diminishing of sonorous rales over base of right lung. Urine contains trace of albumen and numerous bacteria.

*September 25th.* One bath omitted. Similarly three on September 26th. Patient complains for some days about earache. To-day purulent discharges from both ears.

*September 27th.* Two baths. September 28 one bath only, the last one. 108 baths in 19 days.

Patient is discharged as late as December 20th, has fully recovered some time before and enjoys a certain embonpoint.

When hydriatic treatment was begun in this case the condition of the woman seemed desperate—the dyspnoea was exceedingly great, and the Temp. was 41.2; a further very unpleasant circumstance was that she had advanced to the 20th day of her sickness. From the first baths on, her improvement was palpable, the dyspnoea was greatly reduced, and the pneumonia did not develop any further; for on the 4th day of the treatment the bronchial respiration had almost disappeared. This shows that a pneumonia occurring in the course of a typhoid fever is not necessarily a contra-indication against the cold baths, but on the contrary that pneumonias are at times greatly improved by the hydriatic treatment.

**Case VI.** An abortive case. Agathe Choz. 23 aet. Always strong and healthy, chamber-maid on an estate is taken sick after an indisposition of short duration August 24 1868 with a rigor, pain in all the limbs, pain

in head and nape, tendency to vomiting, no sleep, vertigo, red, coated tongue, abdomen distended, P. 120.—Treatment, calomel 0,5.

*August 26th.* Transient improvement after the calomel. Last night delirium, to-day menstruation begins. P. 120, T. 40,0. Treatment, calomel.

*August 27th.* Pronounced brain-symptoms, much cough, no roseola, spleen enlarged. T. 40,6. P. 146. Treatment, bath every three hours.

*August 29th.* Symptoms milder, no more brain symptoms. T. 40,0 (three hours after bath) P. 120.

*August 30th.* Perspiration during night. T. in the morning 36,9. All the symptoms have vanished. Slow recovery. Loss of hair.

This is a case of abortive typhoid, differing from the mild typhoid by its shortness, its intensity being severe enough.

**Case VII.** Typhus levis. Rapid recovery. My [Brand] second daughter Anna 12 aet, is taken sick with symptoms of a mild indisposition in the country, apparently requiring but little attention, after her brother had just recovered from a severe attack of typhoid fever. July 9th 1870 she had a slight chill. August 10th the thermometer reveals, quite unexpected, a F. temp. of 40,0. In the absence of a bath-tub, ablutions and compresses.

*July 11th.* Great dullness, headache, tongue dry, coated, abdomen somewhat distended, no passage, spleen large, P. between 90 and 100. Great heat and thirst. No cough. T. 39,3—40,6. Treatment: a bath every three hours according to the formula.

*July 12th.* In consequence of the closeness of the weather the effects of the baths are very moderate, although hands and feet remain cold from one bath to the other. Sleeplessness and restlessness, no heavy feeling nor head-

ache. Tongue and abdomen the same as yesterday. Much pale urine. P. 120. T. over 40,0.

The chill begins after the bath has lasted 13 minutes. Five baths. 15 grains of quinine after midnight.

*July 13th.* Seven baths. Action of quinine good. Strong vinous odor from mouth. Little sleep, much sighing. Head clear, tongue coated, passages normal a few roseolae. P. 100. T. below 40,0.

*July 16th.* Excepting the coated tongue, thirst and fever, no symptoms. Emaciation marked. P. 88. Temp. gradually declining. Five baths.

*July 18th.* Patient feels well. No bath necessary last night. P. 82. T. 38,5—39,8. Three baths.

*July 20th.* Fever gone. Patient leaves bed. It being war time patient is obliged to return home, a railroad journey of 23 hours does not interrupt the good condition.

**Case VIII.** H. soldier, sick nine days, in bed three days. Headache vertigo, tinnitus, staggering; tongue dry, coated, trembling, strong diarrhoea, spleen swollen, three rosealae spots. P. 120. T. 40,0. Weight of body 57,01 kilo, decubitus December 29th, 1870 p. m. day of admission and beginning of hydriatic treatment.

*December 30th.* Restless night. Patient in stupid condition. Two passages, urine 1300 c c. P. 120. T. fallen, 38,7—39,8. Seven baths.

*December 31st.* Moaning and restless during night, intellect clearer. Tongue deep red and coated, three passages. Urine 3400 c c. P. 92. T. 38,4—39,0. Four baths.

*January 1st 1871.* Symptoms improving from day to day, roseolea disappears, mild delirium at night. P. 90. T. 37,8—39,1. One liquid passage, urine clearer 5600 c c—4 baths.

*January 6th.* General condition good, appetite returning, nights more quiet.—2 baths.

After taking now and then a bath of 27° C. he is well .  
*January 21st.* Body-weight on this day 54.8 kil. When discharged 62.7 kil, which is 5,6 kil more than at admission.

These mild cases are communicated in extenso, so that those who treat such cases with medicines may compare the course under the different forms of treatment.

I think it can be assumed that under indifferent treatment the duration of the disease would have lasted at least a number of weeks and even if the patient had recovered the after-effects would have shown themselves for weeks.

Here the symptoms which were not at all mild disappeared within the first 3—4 days of treatment, and the feeling of being sick vanishes from the patient as soon as the fever has gone down, and even before, the patients are able to go out of doors and their strength is preserved in a remarkable way. That a convalescent from typhoid fever, four days after the decline of the fever should make a rail-road journey of 23 hours, without suffering any bad effects from this undertaking, is not apt to be possible or advisable after medical or indifferent treatment.

**Case IX.** R. soldier, 28 aet. Sick 19 days. Besides the ordinary symptoms of typhoid fever, hoarseness



and strongly developed bronchial catarrh are present. T. in the first 24 hours, without baths 39,1—39,7. P. 100. Urine 700 c c., turbid, three passages.

*January 31st, 1871.* Beginning of hydriatic treatment.

*February 1st.* Tongue dry and red, two liquid stools, much moaning and coughing. Marked chill after bath. P. 94. T. 38,9—39,6. Urine 1800, dark—five baths.

*February 3rd.* Great weakness, less cough. P. 84. T. 38,7—39,6. Urine 2600, somewhat clearer.—four baths.

*February 6th.* Condition satisfactory, good sleep, cough and moaning less. P. 88. T. 38,8—39,5. Urine 1500 c c., still dark—five baths.

*February 7th.* No complaints, only hoarseness and hardness of hearing. P. 94. T. 38,6—39,4, urine 1800—two baths.

*February 9th.* Good condition, excepting hoarseness and hardness of hearing. Patient died during after-dinner sleep, without his neighbor noticing it.

Post mortem examination revealed typhoid ulcers, almost healed and fatty degeneration of the heart.

**Case X.** *Grave typhoid, rapid development, recovery.* My (Brand's) oldest son Ernest, 15 aet, of the corps of cadets in Berlin, does not present during the Whitsuntide vacation his usual liveliness. He is tired, sleepy, quiet, has no appetite and a coated tongue: On the day of his intended departure, (June 6th 1870,) he declares himself unable to get out of bed, complains of feeling sick, and of having had a chill. T. 39,5. P. 100, at noon T. 39,3. P. 100. In the afternoon he complains of numbness in hands and feet, nausea and pain in the stomach. Upon examination two lumbar and two thoracic vertebrae

are found to be tender, liver swollen. At 4 p. m. T. 40,1. P. 94, at 10 p. m. 40,1.—Baths.

*June 8th.* Restlessness, delirium and moaning during night. Head clearer to-day, tenderness of liver and vertebrae less, tongue more moist. From Berlin the report arrives that besides my son a number of cadets have been taken down with typhoid fever. T. 39,0—40,3. P. 92—six baths.

*June 9th.* Night passable, restlessness, delirium diminished, less pain, urine pale, but in small amount. T. 39,2—40,2. P. 96,—five baths.

*June 11th.* Condition satisfactory, intellect clear, all pain and the feeling of numbness have disappeared.

Asks for frequent baths, asserting that the hotter the body, the more unpleasant the baths. After sleeping the cheeks are red and hot. A good deal of sleep between the baths. Roseola absent, spleen much enlarged. T. 38,3—40,5. P. 84—100. Very irritable.—eight baths.

*June 12th.* The symptoms of typhoid disappear one after the other, tongue moist, appetite lively, no belching, one semi solid passage, a great deal of sleep, a large amount of pale urine, the chill after the bath moderate. T. 39—40. P. 84,—six baths, the effect of the bath good. (20 C.)

*June 13th.* Two roseolae, patient no more alarmed when aroused from sleep, as heretofore, strength returns. T. 39,0—40,4. P. 88,—eight baths.

*June 14th.* Condition satisfactory; appetite accute. T. 37,8—39,9. P. 88,—five baths.

*June 16th.* The experiment to allow the patient to sleep longer at night, has unsatisfactory result. T. 40 and bad general condition. Passages solid. T. 38,7—40,0. P. 78. A great quantity of pale urine.—six baths.

*June 17th.* Condition satisfactory; patient occupies himself killing flies. T. 37,5—39,3. P. 92,—five baths.

*June 19th.* No complaints excepting hunger. T. 38,3—39,0. P. 80,—four baths of 28° ten minutes duration.

*June 22nd.* T. normal. Patient gets up.

(See plate V. Fig. I.) The case is notable on account of high temperature not often observed on the first day. A regular ascent does not take place no more than the febris continua during the second week; towards the end of which a tendency to an intermittent type is observed.

The temperature has the tendency to rise after each bath to its original height. From the fourth day on, the force of the fever is broken, it reaches 40° only at a certain time, when a mistake in the treatment has occurred, that is when the patient has been allowed to sleep too long. The highest points of the curve therefore are to be found near midnight, The antipyretic effect of the baths increases after the fourth day.

Even on the eighth day the period of remissions are of longer duration and a smaller number of baths is required. On the 15th day the fever has disappeared without any accidents.

These two observations illustrate some of my propositions (Brand) with rare completeness.

As is well known Liberman, Wunderlich, and many others (Pepper's system) demand that

the water treatment should be reserved for the grave cases and that the milder cases should be treated with medicines or indifferently.

Well the first one of these two cases is certainly a mild case and ends fatally, although by the water treatment all febrile symptoms have been made to disappear. The man is feeling as well as he can, when death suddenly supervenes. All the symptoms are moderate, the temperature relatively low, and yet fatty degeneration of the heart has been developing, causing instantaneous death.

Hence it follows, that it is a mistake to look upon typhoid fever with mild symptoms with indifference.

The sudden death did not come quite unexpected.

The small amount of urine and its dark color are always a sign that something abnormal is in progress in the system of the typhoid fever patient, that something unexpected may turn up. What it may be, is hidden often enough. Nevertheless the sign is useful because it demands carefulness and may prevent surprises.

A *pendant* for the first observation is the second. Here the disease develops rapidly with symptoms, which make a grave case probable and which call for an unfavorable prognosis.

The local disturbances of the stomach and liver, the intense affection of the brain, the participation of the spinal cord, the rapidly increasing weakness (on the evening of the first day the patient could neither stand nor walk) the high temperature—all these symptoms even on the first day pointed to the fact, that the infection must have been an intense one, that the poison in all probability had entered by the stomach and that the patient would have hardly lived to the ninth day under indifferent treatment. As a matter of fact 25 per cent of the cadets that were taken sick died.

The water-treatment conducted by myself the father, in this case had a brilliant effect. Notwithstanding the intense development of the symptoms everything took its course just as it should have done and as it had to do; not for a moment did care or anxiety weigh down my spirits after the diagnosis was certain and the treatment had been instituted. The boy did not only recover but developed into a stronger man than I had ever dared to hope.

**CASE XI.** MADAME R., 28 aet, blond, good physique, allways healthy. Ill ten days, roseola and enlarged spleen.

*June 8th, 1872.* T. always over 40°, insomnia, delirium, cannot remember anything, hard of hearing, two liquid passages passed involuntarily, tongue dry P. 96—baths.



*June 10th.* Fever under control, T. 38,1—40, P. 120, quiet sleep, consciousness clearer, much pale urine—seven baths.

*June 12th.* Patient sleeps and rests quietly, diarrhoea diminished,—five baths.

*June 13th.* P. 120. T. 38,2—39,5, angina and aphthous patches in mouth,—six baths, chlorate potass for gargling.

*June 14th.* P. 110, T. 38,3—39,3, some cough, swelling of lymphatic glands of neck, sensorium clear, passages solid, one furuncle,—five baths.

*June 15th.* P. 125, condition quite good, hardness of hearing and weakness of memory still present. T. 38,2—39,6, much pale urine,—four baths.

*June 17th.* P. 120, T. 38,5—39,6, condition satisfactory, great irritability, good appetite, wants to get up.—six baths.

*June 20th.* P. 100, T. 38,1—39,5, much cough, pain in larynx, pain in toes, urine abundant and clear—four baths.

*June 22nd.* P. 110, T. 38,2—39,6, angina, lymphatic glands swollen, pain in larynx has disappeared, great appetite and impatience—three baths, two grains quinine.

*June 23rd.* The action of the quinine good, P. 96, T. 38,0—39,4, everything normal aside from the deafness, several furuncles, gets out of bed and spends an hour in the garden.—Last bath June 24th. Prespiration. July 6th complete recovery, hearing perfect.

This lady lives at a distance of 30 (German miles) from here. Summoned by telegraph I find besides her a sister 16 years of age in a dying condition. I make an effort to save her, and I am able to recall her to consciousness, but after some time she succumbs to the fever. Aside from this patient the family had lost four grown children

from typhoid fever. A fifth one, a young man of 21 dies a year later from typhoid fever in a hospital here. Out of the seven children, which have been attacked by the typhoid fever, the one only treated with water by myself survived.

See plate V., Fig. II. The combat with the fever, although the case was a grave one, lasts but two days. From the third day on the effect of the baths increases and after the fourth day the average temperature sinks to below 39. Complete deffervescence on the 27th day of sickness.

**Case XII.** Grave typhoid, severe brain affection, persistent diarrhoea, curious behaviour of pulse, recovery.

Miss F. 30 aet, always healthy, of irritable temperament. Prolonged prodromi, chill July 5th 1868, took to her bed July 6th, when delirium and unconsciousness began. On the 8th a dose of castor oil produces diarrhoea. Under other treatment until the evening of the 11th when the water treatment was begun. Complete unconsciousness, loud delirium, makes strong efforts to get out of bed. Has not slept since beginning of sickness. Covered with perspiration, hands and feet cold. Face dark red. Mouth closed spasmodically. Spleen enlarged. Roseola. Involuntary discharges. P. 120. Patient is so restless, that the thermometer cannot be used to ascertain the temperature. Menses present. In the first bath 18°C. (65 F.) and affusions of 10°C. (50°F.) and ten minutes duration, consciousness does not return, skin is reddened. One hour after the third bath, 10 p. m. T. 37.5.

*July 12th.* Night poor, no sleep, extreme restlessness. Measurements impossible. At 10 a. m. consciousness has returned. Patient recognizes me. Face rather pale

than red. Tongue red, coated, dry. No perspiration, hearing affected. Patient quiet, slight cough. P. 100 Urine dark and scanty. T. 38,0—40,1.—Seven baths.

*July 13th.* Great restlessness, delirium continues. P. 84—96. T. 39,4—40,2.—Seven baths—one dose 0,02 grm ( $\frac{1}{3}$  grain) morphine. Seven hours sleep after the morphine, restlessness much diminished, intellect clearer.

*July 14th.* Obtuseness of hearing very marked, tremor, difficult speech, diarrhoea profuse, no longer in bed. P. 88. T. 38,8—40,8,—six baths.

*July 15th.* Brain-symptoms are disappearing, T. higher. 16—18 passages in 24 hours. After sleeping the T. always higher; patient therefore is ordered to be awakened for her bath. P. 94. T. 38,4—40,5—eight baths.

*July 17th.* Tongue cleans off, moist, 26 evacuations Pain in heels. Urine pale, P. 112, T. 37,6—39,6,—six baths. Starch enema with opium.

*July 18th.* Fewer evacuations. Sugillation on legs. Slight furunculosis on chest and back. General condition good. P. 100, T. 38,0—40,2,—four baths.

*July 19th.* Much quiet sleep, T. 38,3—40,2, the high temperatures always after the sleep,—five baths.

*July 20th..* Diarrhoea continues three times a day nevertheless much pale urine. Face collapsed, P. 120, T. 37,4—40,2,—five baths.

*July 21th.* Seven evacuations, urine abundant of light color. Hunger! Furuncles healing: Pain in both heels. P. 112, T. 38,3—40,1—four baths. Wine every 3 hours, friction of heels with alcohol.

*July 22nd.* Too much excited from the wine, it is omitted. P. 100, T 37,7—39,4,—five baths.

*July 24th.* Sugillation spots on both arms, both nates red. Eleven evacuations, tongue red, tympanites

very moderate. Sleep good, P. 112, T. 37,8—39,1—three baths, a pill containing: Tannin, Ext. Nuc. Vom.—Opium to combat the diarrhoea.

*July 27th.* Two passages. Furuncles and sugillations have dissappeared. Patient feels well. P. 112, T. 37—39,7,—two baths.

*July 28th* Patient gets up. Transient exacerbations of fever, probably due to eating too much —Bi-carb. soda.

*July 30th.* Feels perfectly well, sleeps much, gains strength. No evacuation, urine abundant. P. 128, T. 37,7—39,0,—last bath.

*August 3rd.* Complete recovery.

As can be seen, baths of moderate temperature were sufficient to reduce the high fever even though perhaps a day more may have been required, than if colder proceedures had been employed. The sweating present in the first days did not prevent the employment of the baths, nor did the presence of the menses. The obstinate continuation of the diarrhoea under the hydriatic treatment is a rare occurrence. Amongst all my cases there are two only which needed special attention on this account. The high temperature in the middle and near the end of the disease can be explained by faults in the nursing. The patient was allowed to sleep too long, and to eat too much. Contrary to the rule the brain was not quieted by baths alone and morphine had to be made use of.

**Case XIII.** Grave typhoid, clonic and tonic convulsions. Recovery. Erich H., 2 aet, parents healthy was taken sick during the prevailing epidemic  $2\frac{1}{2}$  weeks ago, with gastric symptoms, restlessness, sleeplessness, high fever. After some days there were added to these symptoms during an evening exacerbation convulsions in the back part of neck and twitchings of hands lasting 15 minutes and ceasing after the appearance of nose bleeding to return soon in frequency, spreading over the whole body and continuing for several days and nights. High fever and burning skin, P. 130. Child is lying on his back with eyes open and rolled upward, unconscious, unable to hear, the expression is wasted, face pale excepting during exacerbations, when it is red. The nape of the neck is rigid, convulsive movements all over body, abdomen distended, tendency to diarrhoea, involuntary evacuations. In this condition the little patient has been night and day and has not closed his eyes to sleep since the beginning of the sickness. No medicine have been of any avail to produce any amelioration. Treatments: A warm full-bath of ten minutes duration of  $35^{\circ}$  ( $95^{\circ}$  F.) with affusions of  $20^{\circ}$  ( $68^{\circ}$  F.) every four hours, compresses etc.

*December 18th.* (19 | 1.) Sleep of short duration with half closed eyes; exacerbations less severe, twitchings only now and then. P. 120.

*December 21st.* (22 | 4.) Consciousness and hearing present, the stiffness of the nape of the neck has disappeared, convulsions weak, and short. Eyes closed during sleep, keeping right direction during waking. Signs of returning power of self-control. No passages. P. 96. Treatment: Four baths daily, nutritive diet, enema.

*December 3rd.* (24 | 6.) Convulsions rare and insignificant. Good appetite.



*December 25th.* (26 | 4) Beginning of recovery. Since yesterday no convulsions. Treatment: Three half-baths of 27° (80 F.) five minutes, compresses, nutritious diet.

*January 10th 1859.* (42 | 24) Complete recovery. The hair finally came out and the child, according to the fathers statement, has grown strong and healthy.

**Case XIV.** Mrs. W. 25 aet, Small and delicate, mother of a child 14 months of age. Chronic bronchitis and pneumouia, upper left lung. Tendency to fainting spells and rheumatism. Does not know that she is pregnant three months.

The typhoid fever begins with marked feverish attacks followed by intermissions, after that continuous high fever.

*January 6th.* She is unable to leave her bed. T. three hours after the bath always 40—41,4°. (104—107 F.)

On the 14th day severe abdominal pains, which create the suspicion of peritonitis. On this account, and because the family physician is not successful in reducing the fever sufficiently, my advice is sought. 15th day. Patient has aborted while in bath, without being aware of it. Pains have ceased. After using baths of 16° (61 F.) and 15 minutes duration the temp. rises to 40° (104) only after 4—5 hours.

22nd day. General condition excellent. Lochiae regular, high temp. continues. The baths to last twenty minutes.

29th day. Lochiae have ceased. Appetite voracious. Patient refuses to be bathed, asserting that she will suffocate in the bath. The husband enforces the bathing; patient does not suffocate. (simulation.)

35th day. The high temperatures cease. Patient does not object to bathing but prefers cooler and shorter baths.

42nd day. Patient leaves her bed, and although always conscious, she does not remember anything out of the last weeks. Promenades in room without support.

52nd day. After five days of complete health the temp. rises again, gastric symptoms make their appearance vomiting, diarrhoea, sleeplessness, tympanites, acute pain in left hip joint and right shoulder. The excessive pain upon being moved, enforces the omission of the baths.— Quinine 1,5 grm. (23 grains) to be taken in one dose at night.

53rd day. Quinine without any effect. Sleeplessness intellect clouded, delirium, subsultus tendinum, involuntary evacuations. P. 110, T. continually over 40°.

55th day. The case begins to look very serious. Complete unconsciousness, subsultus delirium. P. 120 very small, T. 40,3—40,6. Gangrenous decubitus over trochanters and heels. Quinine in 2 grm. doses, inefficacious. Treatment; When temp. reaches 40° a gradually cooled down full bath.

59th day. Improvement apparent. Pain dissappeared in bath.

61st day. Patient feels completely well. Slow convalescence on account of the numerous bed-sores.

The perusal of the history of this case is to be recommended to those opponents of the water treatment, who prefer quinine to the bath.

Certainly this question is pertinent: Would this patient have been saved by medicines? I answer with a decided *no*. A continuous high fever of the character before us is not compatible with life, and quinine failing to come to our aid, its suppression was simply impossible.

The case teaches that a chronic pneumonia (phthisis) or chronic bronchitis does not grow worse under hydriatic treatment.

The case demonstrates further that an abortion and the puerperal state take a normal course under strict hydriatic treatment (baths of  $16^{\circ}$ , twenty minutes duration in a room of  $20^{\circ}$ .)

The case shows also, that the temp. can always be reduced, if the necessary energy is not wanting, and that quinine is not necessary for that purpose. The patient had received up to my appearance on the scene, luke-warm half-baths with cold affusions, too warm and of too short duration to produce the necessary reduction of temperature. The cold baths of  $16^{\circ}$  and twenty minutes duration very promptly brought down the temp  $2^{\circ}$ .

It is interesting to observe the efforts of the patient to free herself from further bathing by simulating suffocation in the bath. The same mental attitude is not unfrequently found in the case of honorable colleagues, suffering from typhoid fever, they ask that the temperature be taken in the mouth and clandestinely manage to bring the bulb of the instrument on the upper surface of the tongue instead of beneath it in order to present a temperature which will not require a bath. I know of two such cases.

The preservation of the strength in spite of the long duration of the fever (41 days) must excite admiration. On the very first day after the patient was out of bed, she felt, as she expressed herself, strong enough to dance.

Very instructive is the condition during the relapse. As long as the hydriatic treatment was carried out the condition of the patient leaves but little to be desired. The baths have not been omitted more than 24 hours, when the complete typhoid fever picture presents itself and the symptoms indicating a grave condition; gangrenous bed-sores appearing on the third day.

When necessity—in spite of the pain—did enforce the resumption of the baths, not only the pain but all the symptoms of typhoid fever vanish in four days.

Evidently the omission of the baths was a mistake which almost cost the life of the patient. Others may derive benefit by this confession of mine. I, for my part, shall be careful not to interrupt the water-treatment in a case of typhoid fever hereafter on account of rheumatism or any other complication.

That menstruation, pregnancy, abortion, the puerperal state do not forbid the water-treatment, on this point there is universal consent.

**Case XV.** Grave typhoid, chronic bronchitis and emphysema. Wendt, 32 aet, has been [on account of of bronchitis and emphysema] in the hospital for some time. Six days ago he reports as worse, complains about chilliness and heat, stich in side and oppression in breathing. Condition is looked upon as an exacerbation of the old trouble; dullness, bronchial respiration etc, not to be detected. In the night from February 2—3 he begins to grow delirious. Examination reveals a red, coated tongue, slight tympanites, enlarged spleen, borborygmi, rales over whole chest, hot head, injected conjunctivae, P. 94, T. 39,5. Body-weight 135 lb., 9 oz. Beginning of treatment after formula 5 p. m. compresses.

*February 4th.* The baths do the patient good, although he coughs much in and after the baths. Between the baths much sleep. Delirium at night.

Head clearer after the baths. One liquid stool, urine 300 c c. P. 94 T. 37,7—40,2—7 baths.

*February 6th.* Much moaning and delirium; cough and expectoration abundant; one liquid stool daily, urine 400, dark. P. 120, T. 38,2—39,9—7 baths.

*February 8th.* Head clearer, less delirium, more sleep. Chest symptoms the same, no oppression. Coarse and fine rales as previously. Much cough during bath. One passage. Urine 1900, of lighter color P. 112. T. 37,8—39,7—7 baths.

*February 10th.* Tongue grows moist, less red. Head quite clear, some moaning during sleep. Rales diminished over chest. Same as before the attack of typhoid. Urine 2000. One passage. P. 120. T. 37,5—39,4—6 baths.

*February 12th.* Cough variable, at times more, at times less. Expectoration diminishing. Fever ceases Two passages. Urine 1900. P. 94. T. 37,9—39,4—2 baths.



*February 14th.* Temperature does not reach 39 since yesterday. Head clear, tongue moist, appetite. Chest symptoms mild. Urine 2900, clear as water. Three passages. P. 78. T. 37,5—38,5. No baths.

*February 20th.* Patient gets up to leave hospital, March 15th with a mild bronchial catarrh and a body-weight of 87,85 kilo.

This observation shows that the existing catarrh is not only not made worse by the water-treatment, but that its increase due to the typhoid infection is diminished. After the disease has taken its course, the bronchial catarrh is even less than before.

**CASE XVI.** To present a picture of the difficulties, with which I [Brand] had to contend during this epidemic [1877] and to show at the same time the power which the water-treatment places in the hands of the physician, I take the liberty to narrate the following episode recommending the perusal of the same to the opponents of the water-treatment:

B. Clerk, 21 aet, living with his parents one mile from Stettin. but working during the day in an office situated in the typhoid-fever-district, was taken sick July 29th. August 28th the oldest sister, August 31st the two youngest children, September 4th the father, September 5th the mother and September 7th an aunt are taken down also with typhoid fever. Thus seven of the nine members of the family are down with typhoid fever at the same time. One son only, attending school, and a daughter of about 18 years are spared.

As a matter of course the house-hold affairs come almost to a stand-still, none of the relatives venturing to enter the typhoid-fever-nest, and the spirits of the afflicted persons are thus greatly depressed.

The two youngest children have the disease in a mild form (duration of fever 11 days) the disease of the aunt is of medium duration, (21 days,) of a severer form is the case of the mother, (27 days,) and the father (36 days,) quite grave the case of the oldest daughter (48 days.) The latter is chlorotic and in a low state of health, when attacked by the typhoid fever, which takes its course as a continuous fever with high temperatures. The effects of the quinine and the baths are not what one might wish for. For 21 days a bath of 15° (59 F.) has to be given every three hours, night and day. On the 22nd day hysterical convulsions and an attack of syncope make their appearance, the temperature remaining high. The patient absolutely refuses to be bathed any further and has to be compelled by myself to do so. While parleying the temperature has risen to 41,5° (107 F.) On the 25th day retention of urine and vesical spasm. On the 30th day bronchitis and pleuritic pains. On the 31st day quinine calls forth severe stomach ache and vomiting lasting three days, in consequence extreme weakness, uncountable pulse etc. The attendants give up all hope for recovery, the nurses refuse the continuation of the baths and prefer to pray. It requires all of my authority to have them go on with the treatment. Disappearance of the fever on the 48th day. During convalescence the patient has an attack of sciatica. On the 72nd day the young lady, who according to all appearances had been doomed to die, is found sitting at the piano and playing in her customary perfect manner. Perfect recovery (sciatica included) November 7th.

What would have been the fate of this family without the water-treatment?

**CASE XVII.** B. Dr. Juris, 26 aet., was not to be subjected to hydratic treatment on account of "heart disease." When intestinal hemorrhage supervened, I was called

in consultation. Nothing but hydropathic treatment would meet the case. I therefore recommended in spite of heart disease and hemorrhage, the formula which was carried out with all thoroughness and which, instead of collapse and renewed hemorrhage, as was feared, brought about a good condition of the patient and rapid recovery.

**Case XVIII.** In the cases of the glove-maker W., over 30 years of age and intemperate, the water-treatment was to be omitted on account of the weak heart. I found him in a very low condition, with a small, miserable pulse of over 140, unconscious, the lungs filled with mucus. The half-bath with cold affusions brought about such a profound change, that after a few days the visits on my part became unnecessary and the patient made a good recovery.

(These two cases were added to show how rare cases must be which form justifiable contra-indications to the method. S.)

**Case XIX.** On the estate K. in the neighborhood, there occurred in rapid succession sixty-four cases of typhoid fever in a population numbering 123 persons. It seemed impossible to use the water-treatment in this instance. Dr. Q., however, removed all the difficulties by changing an old chapel into a hospital, placing the men on one side, the women on the other, a curtain was drawn through the middle, sisters (diakonissinnen) took charge of the nursing and not a single patient died. One of the cases, the wife of the proprietor of the estate, was treated by myself. The young woman was pregnant, suffering from vomiting, and had the whooping cough. In spite of pregnancy, vomiting, whooping cough and typhoid, which combination might have kept back from employing it, the hydratic treatment was carried out systematically, abortion did not take place and the patient recovered.

(Here we learn how difficulties may be overcome, illustrating the old adage that where there is a will there is a way. S.)

**Case XX.** Has more than scientific interest. To mention another obstacle for the cold-water treatment, which perhaps is the most frequent one—poverty—I shall narrate the following episode which is the most touching I have ever experienced. July 14th 1875, I, [Brand,] was called to the narrowest street in Stettin, fourth story, to see a sick child, six years of age, evidently suffering from a severe attack of typhoid fever. An old, deaf, crippled grandmother, next a weak but intelligent looking boy of eleven years, and a sister of the same type, twelve years old, were the attendants of the patient, the parents being absent from home, engaged in earning the daily bread. I informed the children of the nature of the malady and requested that the sister should be brought to the children's hospital, inasmuch as the parents, who had to provide for the maintenance of the family, could not undertake the nursing of the child, and the habitation—one room and one dark sleeping apartment for six persons—seemed not very well adapted for a sick room.

The eleven year old boy declared with a firmness which called forth my admiration, that his sister should not under any circumstances be removed to the hospital; he, the little fellow, was desirous that she should be treated with water, and for no other reason than that had they called in me and not some one else. The situation amused me; but I had to call the boys attention to the difficulties of the nursing, the taking of the temperature, the bathing, etc. "All this makes no difference," was the answer, "only show us what my sister and I have to do, and you shall be satisfied with us." And indeed I was satisfied. Never was there a child better taken care of, than this

child of a laborer, by his eleven and twelve year old brother and sister. Regularly she was bathed, the temperature taken, nourishment given, the record kept, day and night. For two weeks the little man did not get out of his clothes. Unfortunately at the end of July the sister, who had faithfully assisted in the nursing, was taken sick, with temperature of 41 C. (105.8 F.) He thus had to take care of two patients. And now there occurred what perhaps has not happened before, that when he was taken sick himself, August 8th with an evening temperature of 40 C. (104 F.) he did not go to bed but continued bathing himself and his two sisters every three hours, and only laid down to rest at night between the baths. Happily in his case, the disease took a mild form. August 20th he was free from the fever, the other two patients August 25th. The little hero's name—it seems not out of place to mention it—is Franz Witte, and he now is a composer in the the printing establishment of Redei. The records of the cases, which he kept, I have preserved as a souvenir.

(I have inclosed this history in this essay, not only for its intrinsic interest but for practical reasons. I think by relating it to some of our patients (and to ourselves) when the difficulties seem very great, it may help to strengthen—so to speak—their moral backbone and encourage them to undertake things which rarely will involve difficulties as great as this eleven year old boy had to overcome. On the other hand, there is no doubt that if we had, or once shall have, the public in the condition of mind in which the boy was, we shall have the most of the difficulties of the water-treatment overcome;



for where there is a will there generally is a way.

Just by way of contrast let the reader, if he has time, take down "Pepper's System," and look at some of the objections he will find there enumerated. It strikes me that while the young German boy acted like a man the American system talks like a child. S.)

**Case XXI.** Gravest typhoid. Convulsions. Recovery. Shoemaker Clich, 34 aet, blond, of small stature, has just removed from the country to the city, where an epidemic of typhoid fever is prevailing, and is soon infected. Toward the end of November he suffers from general ill health, followed by diarrhoea, fever and delirium, which at night are of a noisy character. In one such attack the patient pours while out of bed four pails of cold water over his head and as this proceedure is pleasant to him it is difficult to stop him in carrying it out. The physician who has been attending him is able to make the diagnosis of typhoid fever from the swollen spleen and the roseola. Called on the 8th day to apply the hydriatic treatment, I find the patient in a very precarious condition. Consciousness as well as hearing and seeing have almost disappeared, speech slow and difficult, a typhoid expression of countenance, pale face, dark red during the exacerbations. Dorsal decubitus, extreme muscular weakness, subsultus tendinum. Has not slept a wink since the beginning of his illness. Abdomen greatly distended, spleen enlarged no roseola, constipation. Skin burning hot, P. 150. uncountable during exacerbation.—Treatment: half-bath of 27° C. (80° F.) affusions of 16° C. (61° F.) compresses.

*December 7th.* (9 | 1 day.) The bath is not followed by rest and sleep; on the contrary the symptoms have increased.

Convulsions continue, trismus, subsultus, deepest stupor, greatest restlessness, pulse uncountable, life in imminent danger.—Treatment: Warm full-bath of 35° C. (95° F.) affusions of 30° C. (86° F.) gradually down to 20° C. (68° F.) to last as long as possible and to be repeated three times a day, compresses etc.

*December 8th.* (10 | 2 day. This form of bath produces excellent results: sleep and rest have set in, the convulsions have ceased altogether, subsultus is diminished, temperature less, skin *duftend*. Urine is passed in large quantities. P. 100.—Treatment continued.

*December 9th.* (11 | 3 day.) Improvement sets in: Brain and nervous system quiet; consciousness clear; during the night quiet sleep lasting several hours, no subsultus. T. moderate, skin *duftend*; exacerbation pronounced only towards evening, pulse 88. Vesicles filled with pus appear all over the body.—Treatment continued.

*December 12th.* (14 | 6) day.) Subjective condition good, the baths refresh and invigorate the patient. Consciousness clear, no trace of convulsions. Tongue clean and moist, abdomen flat and painless, passages only when an enema is used, no more involuntary.—No perspiration, skin *duftend*. Urine excreted in large amount. Body literally covered with ekthyma-pustules, between which a number of furuncles appear.—Treatment: Two baths daily and nourishing diet.

*December 20th.* (22 | 14) Pustules decrease and furuncles increase in number; but for their presence the patient would be able to be about. Patient is gaining. Fever insignificant.—Treatment: One bath daily with affusions; no compresses—very nourishing diet, beer.

*January 1st 1859.* (32 | 25 day.) Fifty furuncles have made their appearance and enormous quantities of pus have escaped. New abscesses rarer.—Patient gets up.

**Case XXII.** Grave typhoid. Intestinal hemorrhage. Recovery.

Lindenberg, paper-hanger, 23 aet. Thin but always healthy, after a period of general ill-health was taken down during the epidemic of typhoid fever January 17th 1859 with a heavy chill, but manages to keep on his feet by sheer force until the 20th when, after an emetic, great weakness, high fever and delirium having set in, and he is persuaded to stay in bed. January 23rd severe nose-bleed occurs prostrating the patient more, and on the evening of that day I am called to apply hydiatic treatment.

Status praesens: Eyes wide open, stupid expression of the pale, collapsed face; unconsciousness. He does not know his surroundings, answers, upon being asked in a very loud voice, with much of an effort, that he is doing well, hearing obtuse, muttering, low delirium. No sleep for five nights, restlessness, furious delirium, has to be kept in bed by main force, subsultus tendinum. Head hot, skin dry, Pulse tremulous, uncountable. Lips and tongue dry, covered with brown crusts, swallowing difficult, a little cough. Abdomen flat, no gurgling, no sign of pain. No roseola. Discharge from the bowels and bladder involuntary.—Treatment: Compresses to chest and abdomen to be changed every 15 minutes. Ablutions.

*January 24th.* (7 | 1 day.) No sleep during the night, but the patient rested quietly. P. 150. Tongue moist.—Treatment: Every three hours affusions of three pails of water at 70° F., compresses.

*January 25th.* (8 | 2 day.) The bathing seems to be pleasant to the patient. Consciousness present while the patient is in the bath.

*January 26th.* (9 | 3 day.) Improvement of the brain symptoms; during the night, sleep, the first since eight days. Urine and stool no more involuntary. Expression of the face more lively, hearing better, answers more correct and louder. P. 132, small.

*January 27th.* (10 | 4 day.) The fever decreases, temp. almost normal, head cool, P. 120. Consciousness clear, hearing perfect, strength increasing. Evacuations not so thin and not involuntary.

*January 29th.* (12 | 6 day.) Patient is worse; diarrhoea again sets in and in the evening profuse hemorrhage, great excitement, heat, uncountable pulse.—Treatment: Absolute rest, ice-cold compresses to abdomen. Ablutions.

*January 31st.* (14 | 8 day.) Hemorrhage has not returned; the high fever continues, slight decubitus.

*February 1st.* (15 | 9 day.) Herpes hoster appears on right thigh. Puls 120. One foetid discharge without blood—not involuntary.

*February 5th.* (19 | 13 day.) Improvement sets in. Furuncles and abscesses everywhere, herpes fully developed, brain clear, appetite returning, passages begin to get normal.—Treatment: Half-bath of 28°.

*February 17th.* (31 | 25 day.) Complete recovery, after some difficulty in swallowing has been experienced.

**Case XXIII.** Very grave typhoid. Bilateral pneumonic infiltration. Recovery.

Mr. P. 24 aet. Merchant, always healthy, slight ailments excluded, does not feel well for 14 days. Suffering loss of appetite, vomiting and great loss of strength, (has one fainting spell,) but being of the opinion that he is merely suffering from a cold, he does not go to bed but takes a Russian bath.

(November 1st 1858.) But instead of getting relief from his supposed cold, his illness increases rapidly, rigors changing off with exhausting perspirations and diarrhoea are added to the symptoms and his weakness increases to such a degree that at last on November 3rd the patient is unable to leave his bed. November 4th cough sets in, at first of a dry character but afterwards accompanied by the expectoration of bloody colored mucus and thin blood. Two physicians diagnosticate double pneumonia.—Leeches calomel, mineral acids. So much the patient remembers, after this complete unconsciousness sets in. He is delirious day and night and has to be kept in bed by force and in spite of everything being done for him all hope for recovery has been given up by November 14th.

On this day at noon, to make a last trial with the hydiatic treatment I am called in, and find the patient completely unconscious, it is quite impossible to bring him back to consciousness for a moment by any means whatsoever. Subsultus tendium and convulsive muscular contractions, red face covered with perspiration, eyes half closed, mouth open, lips, teeth and tongue dry and covered with black crusts, pulse dicrotic, 120, body soaking wet from perspiration. Respiration anxious, 48. A more accurate physicial exploration being out of place under these circumstances, I order to begin with, the patient to be rubbed with two wet sheets, affusions to the head with water of 14° C. (57° F.) fresh linen and a nourishing diet. During the affusions the patient opens his eyes, but does not return to consciousness; after being taken back to bed he evidently feels more comfortable. Physical exploration reveals behind and below dullness over the thorax, especially over the left side, with bronchial respiration, everywhere else tympanitic resonance, and coarse mucous rales



all over the chest; tumefaction of the spleen, tympanitic distention of the abdomen, tendency to diarrhoea.

At 5 o'clock p. m. a violent exacerbation, red cheeks, restlessness, moaning, pulse 140, respiration 52. When being rubbed now with a wet sheet the patient does not even open his eyes even if water of  $8^{\circ}$  C. ( $47^{\circ}$  F.) is being used. Unconscious when brought back to bed, he remains quiet, does not moan, pulse goes down to 120, respiration to 36, no cough. Skin odorous, the streaming perspiration has ceased, evacuations from bowels and bladder involuntary.

*November 16th.* (17 | 2 day,) Unconsciousness continues unchanged but the nervous and vascular system quiet down, more and more, pulse 112, respiration 28. The affection of the lungs does not make itself known by any symptoms, no cough, bronchial respiration and dullness still present.

Under these circumstances I do not hesitate to have the patient transported while resting after his morning bath and packed in his bed (the temperature out doors being  $8^{\circ}$  C.) to my hospital, where he arrives without having been awakened.—Treatment: A half-bath of  $28^{\circ}$  C. ( $80^{\circ}$  F.) with affusions of  $17^{\circ}$  C. ( $63^{\circ}$  F.) of 10 minutes duration, compresses, boullion.

*November 16th.* (Evenings.) Rest and sleep the whole day, with closed eyes and closed mouth, P. 90—100, respiration 28—30. No cough. Lips and tongue clean and moist, diarrhoea diminishing. At 8 o'clock p. m. severe exacerbations sets in. During the bath now ordered the first signs of returning consciousness present themselves.

*November 17th.* (17 | 3 day,) Improvement of the brain—fever—and abdominal symptoms. During the night ablutions are sufficient to produce rest and sleep. A

9 o'clock severe exacerbation, one hour after the bath pulse 96, respiration 24. No cough. The muscles have not yet quieted down. No evacuation for 36 hours.

*November 18th.* (18 | 4 day.) Definite return of consciousness, evacuations no more involuntary. Appetite is returning, P. 84. R. 22, dullness and bronchial respiration have disappeared. No cough, no expectoration, no sweating.

*November 19th.* (19 | 5 day.) Improvement begins. Numerous furuncles superficial decubitus. No cough, no expectoration.—Treatment: Three half baths daily of 28° with affusions of 22°; compresses to abdomen only.

*November 21st.* (21 | 7 day.) The exacerbations of the fever cease. Pulse 72, rapid recovery; patient gets up. exposed corium makes lying down painful.

*November 24th.* (24 | 10 day.) Much pus evacuated from the furuncles, emaciation, weakness and irritable temper. No cough nor expectoration.

*December 16th.* (47 | 32 day.) Recovery complete.

**Case XXIV.** Gravest typhoid, exudative pleurisy, gangrene of lungs, recovery.

Bertha S. 16 aet., of strong constitution, but irritable nervous system is taken sick after having been at work day and night preparing for the holidays, at the time of the epidemic of typhoid fever after short indisposition on December 4th 1858, with the symptoms of an angina.

After the use of calomel and leeches these disappear and the patient begins to feel better, although a pulse of 120 and a feeling of heaviness remains behind. December 10 a stitch in the right side of the chest sets in increasing rapidly in intensity and accompanied by cough and oppression. Inspection reveals diminished motion in the right side of chest, percussion, dullness behind up to the

middle of the scapula and in front to the nipple, auscultation absence of respiratory murmur over the lower part of the right lung diminished over the upper part, rales in both lungs; pectoral fremitus absent on right side, resistance on percussion great. Respiration increased, short dry cough, pulse 130 small; tongue coated, dry, spleen enlarged, abdomen distended, stools liquid. Exacerbation of the fever marked towards evening, moderate delirium at night.—Treatment: Infusion of digitalis with tart. emet., compresses to chest and back every half hour. December 12th, exudate somewhat diminished, fine mucous rales over compressed lung, increase of the stupor.

*December 14th.* Exudate the same, increase of fine rales, which can also be heard lower down. Consciousness more dull, much excitement and delirium towards evening.

*December 15th.* Further increase of the symptoms, temperature high, P. 140, R. 48, unconsciousness complete, evacuations involuntary. Bronchial respiration at lower apex of right scapula.

*December 16th.* Diagnosis of typhoid fever established, water treatment begun; medicines discontinued.—Treatment: Warm full bath of 35° (95° F.) affusions with water of diminished temperature, cooling down of bath to 27° (80° F.) 10 minutes. Unconsciousness continues in and after the bath, patient however more quiet and resting, P. 130, R. 40, sleep. After three hours, exacerbations. No return of consciousness after the full bath, only after the third bath in the morning at 6, there are signs of such.—Treatment: Full-baths of 35° (95° F.) affusions of 17° (63° F.) 10 minutes, compresses to chest and back, ablutions.

*December 17th.* Consciousness clearer, cough severe, dry, disturbing the rest, oppression, physical signs the same. Fever somewhat less.

*December 22nd.* After apparent improvement (diminished fever, easy expectoration,) to-day bloody discoloration of the sputum which is of very foetid odor spreading into the neighboring apartments an extraordinary change for the worse; complete unconsciousness, delirium, very high fever, collapse, face pale, lips blue. Danger increases from hour to hour.—Treatment: Full bath with affusions as before, every four hours. Nourishing diet.

*December 23rd.* Contrary to expectations, the patient has survived last night, a terrible one. Some little improvements; signs of returning consciousness, expectoration more vigorous, sputum abundant, if possible of stronger odor than that of the previous day; dyspnoea less, cough and fever the same. Discharges involuntary.—Treatment, the same.

After the most pressing danger has been overcome for the second time by the aid of the warm baths and affusions, consciousness gradually returns, the gangrenous condition of the sputum disappears, dyspnoea and fever diminish, especially with the appearance of furuncles.—January 1st 1859 the number of baths can be reduced to two, the compresses omitted entirely. Physical exploration does not reveal much of a change excepting that the bronchial has been replaced by cavernous respiration, and the rales have decreased in number, metallic tinkling and amphoric resonance absent. In the beginning of February she leaves her bed; signs of aemia very marked. Hydriatic treatment discontinued, Iceland moss and Heim's pills are ordered for the cough lasting into the summer.

*July 1860.* The lungs are found completely healed, bronchial respiration has disappeared, respiratory murmur somewhat diminished over the affected part; the form of the thorax has not been changed. She later on lost her hair,

[These last four cases have been added to illustrate the treatment of the complicated cases. Several others also, answering the same purpose have been related previously. S.]



## APPENDIX A.

### Personal Experience in Using the Water Treatment.

In this part of the volume I intend saying a little about my own experience with the water-treatment. Not that I wish to bring owls to Athens; my observations have not been recorded with sufficient accuracy, nor made according to a sufficiently definite system, to form the basis for scientific deductions and reasoning. Furthermore they cover the first period of my experience with the water treatment, when serving my apprenticeship, and shortcomings and mistakes in the application of the method would be apt to make such observations of but little value. Still it may perhaps be of interest to the reader, with what degree of accuracy and how extensively an ordinary practitioner in private practice is able to follow the directions given in the previous chapters and to carry out the method; and how under circumstances as we daily find them among the laboring classes with limited means and appliances the results obtained here will compare with those obtained under more favorable conditions, I shall therefore make some remarks as to how the method can be and

was carried out, further concerning the favor with which it was received by the patients and their friends, the difficulties that had to be overcome and the aids one finds in carrying out one's plans. My own experience would thus demonstrate what results my colleagues might reasonably expect to obtain. I hope that others will thus be encouraged to give the method a trial, especially such as have more intelligent and well-to-do patients, where the nursing can be carried out with still more accuracy than was possible amongst my patients. I hope that many will give the method a thorough trial, though they may not yet have absolute faith in it.

For about 20 months I have been trying the method. But why have I not done so sooner? I and perhaps others have not done so because we were waiting for those sitting on Moses' stool to do so first, and because we ordinary practitioners, especially as long as one counts himself with the younger members, assume as a matter of course that those men who take upon themselves the responsibility of instructing others and keeping them informed about valuable additions to our art and science, are better equipped to test and weigh the value of any new method. Here I am convinced I made a great mistake. So when the

statistics of the results of Brand's method passed under my eyes, I made up my mind to go ahead myself, and not wait for another edition of "Pepper's System" to prop me up. I had a large bath tub made of galvanized iron, and set it aside waiting for a case to use it.

Using the method it became clear to my mind why it was folly to wait for authors and professors. It is customary to have new methods tried in hospitals first, and when found successful here the genreal practitioner is willing to use them in private practice. If we American physicians intend to wait for good results in American hospitals, we can wait until doomsday and not see any; and this for two reasons. In the first place, the cases come under treatment far too late for the method to have a fair chance. Brand himself points out on analogy to the antiseptic method in surgery; only when the surgeon has control of the wound from its beginning, and even before it is produced, can he expect the beneficial results of the method and not when the wound has been exposed for five or ten days to all sorts of influences; so also we cannot expect the preservative and stimulating qualities of cold water to do good after there is nothing left to preserve and stimulate. In the second place, I have my doubts whether in any hospital where the attending physician has not the full

control of the nurses, the right to employ and discharge them, he can expect the cold water treatment to be carried out accurately, so as to show its full beneficial effect.

Nor do there exist perhaps in many hospitals the necessary conditions for carrying out the method even though the hospital authorities have the good will to have this kind of treatment carried out. *Vogl* says that his patients are treated in frame pavilions 100 x 20 feet in dimensions, each containing 30 beds and richly supplied with windows. Four of these beds are occupied by the nurses, who sleep in the wards, and as each case of considerable gravity has two beds at its disposal, not more than 12 patients of this character are admitted into such a ward. Each three patients thus would have a nurse at their disposition. The bath-tubs, two in number are placed in a separate room at the gable end of the pavilion, where the patients are conveyed so that the remainder of the patients are not disturbed by the procedure. Such arrangements we cannot look for in our hospitals, but may we not hope that the American public will aid the profession in this direction? Untold blessings would revert to the public if the medical students could be thoroughly trained in the use of water in the treatment of typhoid fever (and other diseases.)

As I said before I had a bath-tub made in 1889, six months before I had a patient to use it, and having no one to advise me here, it was a little too large:  $6 \times 2 \times 1\frac{1}{2}$  feet. Since then I have had four more made  $4\frac{1}{2}$  to  $5\frac{3}{4}$  feet long. I think  $5\frac{1}{2} \times 2$  feet by 16 inches (high) will prove a convenient form for the majority of cases. My tubs are made of galvanized iron, are quadrangular, and I suppose Oscar Wilde would be able to offer some criticisms. Hoffman & Heman of Pearl street made them for me at a cost of about \$6.50 for each tub. Anybody who wants to try the method should have his tub on hand, and also his thermometers; an ordinary thirty-five cent thermometer for the bath, and a fever-thermometer for the patient. Having everything in readiness will make a good impression on the patient and his friends: it will not do, besides often no time is to be lost, to send a family, stricken by such a calamity, from one tinsmith to another to get a tub made. Furthermore, expense can thus be saved to the patient.

A board placed slanting in the tub to support the head allows the person to be dispensed with who otherwise would have to hold the head. When in use it may be covered with some soft material, (towels, pieces of an old quilt, etc.) and a few nails acting like hooks will prevent the board from slipping into the water. The patient



thus farther has the back part of the head and nape of the neck constantly in the water, which circumstance would seem in a measure to take the place of the affusions. I intend further providing my patients with glazed iron vessel the capacity of which is known, for the purpose of collecting the urine passed for 24 hours, the quantity of urine passed being a good sign of the accuracy used in carrying out the method properly.

The tubs mentioned were so made as to allow the patient to lie down and rest his head on an inclined plane. Perhaps another form deeper and shorter, in which the patient could remain in a sitting position would be more preferable, especially when affusions to the head are necessary or desirable.

Enumerating some of my cases I shall add remarks here and there as they occur to me without any system.

CASE I. *Miss. Gl.* was a young lady, rather stout, about eighteen years of age. Wit this case two circumstances are connected which are of interest in this matter. The girl was taken sick suddenly with a chill, and I was looking for an apical pneumonia, in fact, thought I had detected some physical signs, when after six to seven days, diarrhoea and tympanites set in and

the diagnosis was clear. This leads me to speak of one of the difficulties in the use of the method. If there are no other cases around, I do not see how we can make a positive diagnosis in a good many cases in the first days when according to Brand the treatment ought to begin to have absolutely good results. I do not see how one can distinguish some of the pneumonias without pain, or some perityphlitis not to mention malarial fevers, where those are prevalent. Typhoid is one of those protean diseases, which varies a great deal, and typical cases we meet more frequently in books than in practice. That it is not only lack of skill on my part I can prove by a case which I saw as a student. I was making the rounds with the attending physician in the Charité, when we came across a young man in a typhoid condition and with high fever. The patient was examined carefully, the diagnosis, as the most probable, was typhoid fever, and a cold bath was ordered. Wishing to see the method employed, I remained to see it applied. The cold water into which the patient was submerged produced deep respiration, cough, and the expectoration of rusty sputum. "Eine Pleumonie," exclaimed the nurse. Now suppose this had occurred in private practice here. Suppose the patient had died; suppose the family thought fit to institute a malpractice

suit—would it not be a rather unpleasant situation? There would no doubt be found old women of the male sex in the profession, who had no doubt that the cold bath was the cause of death, etc. The patient did quite well and showed no ill effect from the bath.

Now that H. C. Wood can be adduced as authority for the harmlessness and usefulness of the method in this country the danger from legal complication need not be feared so much.

The second circumstance connected with my case was that the young lady (perhaps partly on account of her delirium) was longing for the repetition of the baths, at least for some days, until the very high temperature had abated, when she disliked them as much as most of the patients do.

And this, then, has to be said here: By far the majority of the patients have a great aversion to the bathing. They fret, perhaps cry, protest, ask to have the manoeuvre postponed, and take care of the minute hand of the clock so that they do not get more than their share. If, therefore, I meet a case of typhoid fever I inform the family what I intend doing if the case should require it. I explain to them that it will seem like a dangerous and actually will be a somewhat harsh-looking treatment; that the patient himself will not take kindly to it, but

will protest ; that the shivering in and after the bath, the cold hands and feet will probably, nay certainly, alarm the inexperienced; and if the friends or patient should have decided objection to go through such experience, they had better not try the method but call in another physician. For if a family or patient should not have the necessary confidence in me to submit to this treatment after stating my reasons, I think we had better part company. I can say, however, that I had not half the difficulty in employing and introducing this method that I anticipated, and which my colleagues, to whom I may chance to speak on this subject, bring up as an objection. I feel, let me say here, some pride in my patients for having allowed me to carry out my plan, as they had no precedents here in the city to which I could point them.

It would seem to me that in an intelligent family to which the reasons for adopting this line of treatment can be explained, there ought to be no difficulty in having the cool baths used, especially as we can assure the patient and his friends of the harmlessness of the procedure.

I expected in this patient on account of her full habit and age and sex an illness of about six weeks, but was agreeably surprised, to find that after carrying out the method for a number of days, such a marked change for the better oc-

curred, that we had no more than a three week's illness, aside from the trouble which a very deep bed-lone gave us. Perhaps on account of the late date of the beginning of the water-treatment a deep wedge-shaped slough formed in the anal fold reaching down to the bone. This my first case encouraged me very much.

CASE II. *Miss Hae.* This also was a young lady, over 20 years of age. She was not so pleasant to treat. I experienced here that it requires some firmness to carry out the method. A lady friend, who took care of her, and "whose son recovered from typhoid fever without the use of baths", did not support me very much in my efforts. Yet the spiritual adviser of my patient having seen the method employed in Germany was on my side, so that I did not have to yield. The first bath the patient had when her temperature was rising rapidly (105 F.) and her nose was bleeding. The action of the baths was prompt and effective. They were very unpleasant to the patient and she gave us a great deal of trouble. I was somewhat surprised to see that on recovering she lost all of her hair, when I considered how mild the course of the disease was after the baths had gained the victory over the fever.

CASE III. *Mr. Hen.* Was a man, whom I found with a temperature of 106°F. Within a



few hours he was in a bathtub, and the baths acted very promptly and efficiently. The disease took a pleasant course and this patient improved more rapidly than I had anticipated.

CASE IV. *Plg.* was a girl about 13 years of age. This leads me to answering the question as to the number of baths that I have found necessary. This case proved the most stubborn in the first years of my (hydriatic) practice. The temperature would be  $105^{\circ}$  F. before the bath,  $103^{\circ}$  F. one hour after the bath,  $104^{\circ}$  F. two hours after the bath and  $105^{\circ}$  F. three hours after the bath, and this condition continued for 10 days. She received 7 baths every day, beginning at 6 o'clock in the morning and ending at 12 o'clock at night. Along the 11th and 12th day the fever declined rapidly. Having at that time not read much about the methods I ordered on account of her age and immaturity the duration of the bath to be 10 minutes. This perhaps was not correct, and the omission of the 3 o'clock A. M. bath was not commendable. I doubt whether the mother, who had to do all the nursing, would have been so faithful in pursuing the method, had she not lost a child some years before from typhoid fever; furthermore the mother felt satisfied that the baths had a beneficial effect on her child. I think that the least resistance to the method will be found and the

treatment will be carried out with the greatest accuracy in families that have suffered a loss from this disease. In handling this case I also learned how some of the laity explain to themselves the action of the baths. They imagine that the water draws the poison out of the system and thus look upon a bath which the patient has used as a sort of tincture of typhoid-fever, and of course consider it necessary to renew the water for each bath. This woman had carried her cistern dry — I am sorry to say — acting on this theory, I having neglected to mention to her in the beginning that the same water would do service several days. It is well to call attention to this point at once.

As to the number of baths given in any one case the bath-tub generally was left by the bedside for 7—8 days and at least 36 baths were given in almost all cases. Many patients required many more baths than that.

CASE V. *Alb.* Was a girl about 15 years old. The father had had an attack of typhoid fever ten years previously, when he was furiously delirious. He had been treated on the hot plan, and seeing the pleasant effects of the water was only too sorry, that he had not been himself treated with cool baths.

CASE VI. *Chr. M.* This was a young man whose brother had died of typhoid fever  $1\frac{1}{2}$

years previously. The disease was a week old and well developed when he came under treatment. The temperature was high and the diarrhoea profuse. He proved to be one of my worst cases, although the baths acted favorably and the patient was, though semi-delirious, glad to take them. He developed an abscess over the parotis and an inflammation of the hip-joint, leaving the same permanently stiff, and had intestinal hemorrhage in the fifth week. The treatment was admirably carried out. I mention this case to show that my cases were not all mild.

CASE VII. *Wit.* Was a young man, the disease was of medium gravity. His mother, a widow, took care of him, and some of the old women of the neighborhood helped us in the process. This leads me to speak of neighbors. Those who have learned Dr. Luther's catechism know that this practical and noble man mentions "good neighbors" as belonging to "our daily bread." The practical physician will often have occasion to attest the truth of this statement. In the water-treatment the neighbors may be of the greatest aid to the physician and they may be one of his worst obstacles. At times he will have to fight the patient, the patient's mother and grandmother and other relatives. If the neighbors also come in after the physician has left the house and discourage the family, he

may wish that there were no neighbors. On the whole however I have gained more from neighbors in the prosecution of this method than the contrary. I have never seen any of them infected by the patient. Often without their aid it would have been impossible for me to have had my measures carried out. My patients whose means are way below professional or paid nurses are cared for better than patients in the wards of a hospital, and I would suggest neighbors to my colleagues as valuable auxiliaries in this work.

CASE IX. *Mr. Nst.* Of this case I happen to have preserved the record and find that he had 56 baths; it was not a mild case. Here I often observed that the early morning temperatures were unusually high. Since reading T. & B's. book I explain this fact by the circumstance, that no baths in general were given from 12 o'clock at night to 6 o'clock in the morning, which intermission I permitted to give the attendants rest—if the patients also slept, which was the case—although this method is perhaps not entirely commendable. This patient always had a slow pulse. but a slow pulse is no indication of the mischief which the poison may produce in the body

CASE XI. *Mr. Alb.* Was a good deal of interest to me because the patient, a man of 30

aet. came under treatment when sick about five weeks, after having been treated medicinally by another physician. Although all local disturbances—chest and abdominal—were absent, he had had no sleep for a number of days, and I found him with a pulse of about 120 and a temperature of about 104. He was lying in a deep stupor, with his eyes open, stiff from rigidity of the muscles of the back, so that he had to be rolled over like a log, for the purpose of taking his temperature. In the absence of any serious pathological changes, I had him bathed according to the formula, and next morning—I had seen him in the evening—I found a most wonderful and pleasant change. His lips, which had been parched were now red and moist, he protruded his tongue and rolled over on his side, when asked to do so, the temperature had gone down without perspirations, and but a few baths daily were necessary to keep him in a comfortable condition, neither was medicines required to procure sleep. His mother-in-law had been and continued to be his principal nurse, and the opinion she formed about the baths, leads me to say a few words about what my patients and their friends think about the method. I believe I can say that those who have become acquainted with the method, patients as well as their friends, are well satisfied with it and place



confidence in it, notwithstanding that the bath itself may have been unpleasant to the patient and its use a source of extra work to his friends.

The good woman who took care of this patient, had to nurse a daughter-in-law and her own daughter about 12 years of age, after taking care of this patient, and she repeatedly expressed herself that having seen the medicinal and the hydriatic plan of treatment, she had no use for the former, but willingly would undertake the extra labor, which the method entails, when the daughter and son's wife required the baths. Undoubtedly she preferred to see those dear to her in a bath than tormented by delirium. I think I can also say that my patients in general have advanced so far, that they no more fear the cool baths, they only dislike the trouble they make and fear the unpleasant sensations connected with the use of the baths.

The plain people can see too plainly the good effects of the method, so that I even now have but little trouble to induce them to use the water, *Of all my 54 cases, only two refused to try the method when I proposed it, and these two died.* Nor can I see why people should refuse to follow the advice of their physicians in this case. They have their abdomens cut open, their legs and arms amputated, take cloroform and what not, and

why should they refuse to step into a cool bath which we can assure them is a procedure free from danger? Of course as long as the physician has no faith in the method, and proposes it in a half hearted manner, leaving the choice perhaps to the patient, he will have refusals enough. On my mind the results, that others have obtained, have made an impression strong enough for me to feel, that I am not doing my duty to my patients, should I not treat them according to the hydriatic method.

Suppose a lymph had been discovered in Stettin, which could show such results as the cool-bath-treatment actually has done, would not the steamers have been carrying many more American physicians to the coast of the Baltic sea, than they did to Berlin last winter? Or if it were a surgical operation, which would have such a showing would not Stettin be a Mecca for the great and small operators as Birmingham has been? I for my part do say, that if I am not to heed the publications that have appeared on this topic, I do not see why I should read another article containing anything about therapeutics and follow its advice. Why the intelligent American people, who claim to love water, should reject this form of treatment, which by the way seems more aristocratic to me, than swallowing an indefinite amount of medicines, I

cannot understand, nor do I believe that they will after their physicians have been convinced of the great power for good, which lies in this method. And when I hear the objection from physicians, that their patients will not submit to this line of treatment I cannot help thinking of the words: “Denn was die Herren den Geist der Zeiten nennen, ist meistens nur der Herren eigner Geist.”

CASE XIV. *Mrs. Silb.* Was of some clinical interest, because the patient, a woman of about 40 aet, had a continued fever of a very moderate temperature (101—102° F.) for nearly three weeks, when, while I was looking for recovery, the temperature rose higher, 104 and over, the pulse increased to over 130, and some days later delirium set in and I commenced the cool-bath-treatment, which was carried out faithfully for a week and more. She at first liked the baths and was willing to be placed into the water, but later on she protested violently so that her husband had some trouble. At my visits she always was quiet, slept well between the baths, and I was somewhat surprised when, after her recovery, she informed me that she did not recollect having had a single bath. After her sickness her little daughter 10 years old had the disease. She had a violent nose-bleed in the first days, a circumstance which rather induced

me to use the method. She did not require so very many baths and considering the paleness, which she generally exhibits I used baths of a somewhat higher temp. than the formula. The effects of the baths was pleasant.

CASE XVI. *Mrs Hill*. Was a woman about 40 years of age, sick five days, T. 104, diarrhoea and abdominal tenderness present, when she came under observation. While after a few days of treatment the temperature went down just as Vogl describes it the diarrhoea continued in spite of cold compresses to the abdomen, in spite of enemata of laudanum, in spite of bismuth, lead acetate etc. On the 28th day she had a violent intestinal hemorrhage and lost perhaps a quart of blood while pain and meteorism continued for a week and more. She was bathed about a week, 40—50 baths being necessary, and finally when well on to recovery developed a harmless anasura. Case XIX. was another which had intestinal hemorrhage. I mention this fact to characterize the class of cases I had to deal with.

CASE XXVII. *Mrs. A.* was the delicate wife of a physician who had lost a brother from typhoid fever a few months previously. The baths acted as desired.

CASE XXVIII. *Mr. Sp.* was a man about 35 aet. who had lost a sister some months pre-

viciously from the fever. He did not recollect much about the first baths, but it took some coaxing to have him take the baths along the 5th to 7th day of treatment. The action of the baths was as it should have been.

CASE XXIX. *Miss Eck.*, a girl about 14 years of age. We had a good deal of trouble with the first baths which were given the very night I saw her the first time, when her temperature was  $104^{\circ}$ , and the pulse rapid. She was one of the patients who had less aversion to the process as it was continued. She did however not require many baths. After 4 to 5 days but few were necessary, not more than 4 to 5 a day.

CASE XXVIII. *Mr. Sch.* was one of the four cases I saw where the spleen could be felt. He liked the baths and was sorry when the tub was taken away. The baths acted according to Vogl, perhaps because he was treated from the very beginning. He also developed the anasarca during recovery.

CASE XXXII. *Miss Ma.* a young girl of about 20. She also liked the baths. Furthermore she generally could tell by her feelings when a bath was necessary. Although a rather mild case she had over 50 baths.

CASE XXXIII. *J. Sch.* a boy about 14 aet. This patient always had a dark red tongue and a dicrotic, though not very frequent, pulse. He



was the son of a poor widow, who with but a little assistance did the nursing. I think this case shows that in the majority of cases the method can be carried out if the friends of the patient are willing, for what this woman did most people are able to do also. And after all the whole procedure is not so formidable as one might imagine it to be. I shall say here a few words about the way I carried out the method. Having decided upon using the baths, I select the most suitable room in the house and have the bed placed therein, at the same time the bathtub is brought to the house and placed either alongside the bed if it is a severe case that must be lifted into the tub, or anywhere in the room in case the patient is able to walk. I have the patient provide some good whiskey and a jug to be filled with water to be placed against the feet after the bath. I order the bathtub to be half filled with water from the hydrant and hot water to be added until the bath has a temperature of about 85, that is if the case is not urgent. At the same time I instruct the most suitable person present in the use of the clinical thermometer. I allow him to introduce the instrument dipped in lard etc., and after letting it remain two minutes read it while I am present, and shake the mercury down. I have advised my nurses to handle the thermometer over the bed, so that

in case it should drop, it would not break. Still a good many of my instruments have been broken. Women have more accidents with them than men. If possible, I am, in case of a male present myself at the first bath, otherwise I send one of the persons, that I have trained, to see that everything is carried out as it should be, and to encourage the family and the patient. I also always make a second visit in the first 24 hours, to convince myself that everything is understood which so often has not been the case. The first bath I often have given at 85° F., the second at about 80°, the third at about 75° the fourth at about 70°. Often it is simply necessary after the first bath is prepared at 85° to let it cool down itself, at times cold or hot water must be added. If the patient is able and willing to go into the bath, one person is sufficient. If he has to be lifted into the bath two persons are desirable, one taking hold of the ankles, the other under the arm. One of my patients claimed, that in her case a rapid immersion was not as unpleasant as a slow stepping in, first with one foot then with the other etc. I always had my patients rubbed well; whether the sponge or the hand is preferable I could not say. Affusions I have not used so much, because the nervous symptoms were not so very marked, but shall employ them in cases with de-

lirium. The chill and the cold hands and feet will of course alarm the patient and his friends, and if one can manage to be present when the patient is in that condition it will be very encouraging to his friends, because they cannot but be afraid, that perhaps the thing had been overdone at the time and that some harm might have been done. If the physician then can tell them that this condition, which he sees, is just what must be brought about if the patient is to derive benefit, the attendants will become more courageous. At first they will of course have a good deal of feeling for and commiseration with the patient, but as they see the patient improve, sleep after the bath, get stronger, have better appetite, even a mother will get more hard-hearted, and will not mind the somewhat pitiful aspect, which the patient presents after he gets out of the bath. If the patient cannot be dried while standing, I have an old quilt or comfortable placed on the half of the bed next to the tub, on which the patient is dried and then rolled into the middle of the bed. A jug with hot water is now placed against the feet, the legs are wrapped up in warm flannels, and the attendants charged *not* to cover up heavily the rest of the patients body. The cold compresses to the chest and abdomen I have applied when the heat of the surface returned in all the severer

cases, and several times a day (not after each bath) I have the temperature taken to be able to form a conception of the resistance of the body to the cooling process.

In the first year of my (hydr.) practice I had the baths given when the temperature had reached 103. I now follow Brand and other authorities more closely and have a bath given at 102. The water of our hydrants being about 72 in summer, my ordinary formula was a bath of 72 every three hours, when the thermometer in the rectum registered 102 (full).

The attendants keep a record of the measurements, so that, when I enter the room, I can see at a glance much of the patient's condition.

\*To facilitate the keeping of the record I have had some blanks printed of which a sample will be found at the end of the volume. There will also be found there a blank for the purpose of conveniently recording the temperature curve and other important data of any case.

CASE XXXIV. *May*. was my youngest patient, a little girl 19 months of age, whose father died from typhoid fever 2 years previously — before I knew how to use cold water. Her mother had a febrile disease with low morning

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\*) NOTE. These blanks I shall furnish at reasonable prices.

and high evening temperatures and diarrhoea, which I looked upon as an atypical case of enteric fever. The little patient received as many as 100 baths, and had high temperature ( $105^{\circ}\text{F.}$ ) developed a broncho-pneumonia, with but little consolidation in the end of the second week, which was very slow in disappearing. Having at that time not yet read Brand's advice I had the baths perhaps a little too warm ( $80\text{--}75\text{ F.}$ ) and of 10 minutes duration. Perhaps it would have been better to have taken the water a little cooler, about 70 and have had the baths last only 7 to 8 minutes. The patient made a rather slow recovery and developed a purulent nasal catarrh. In her case I did not see that the desire for nourishment was awakened by the baths.

CASE XXXVII. *Miss W.* was one of the cases where the baths acted like a charm. A girl about 20 aet., who had taken care of a family ill with typhoid fever, was herself taken ill. Two days later I found her with a temperature of 105, pulse between 130 and 140 tongue dark red. She was suffering from the fever and had not slept for two nights. One night cool bathing brought about a most marked result. She felt and looked like a different person. The effect of the baths had been pronounced producing a fall of 3 to  $4^{\circ}\text{F.}$  In fact 3 to 4 baths a day sufficed to keep the temperature around 102, and



her improvement may be dated from the night the treatment was instituted.

CASE XXXVIII. *A. G.* was a lad of 14 who was interesting to me, because his parents had come from Munich, where in former years they had lost a child from typhoid fever, but knew nothing of the bath treatment. It seemed curious that a patient should have traveled so far away from Vogl to get into a bath-tub. The patient was well nursed (although many a physician would perhaps have never ventured to propose the treatment considering the poor and uninviting surroundings). The mother seeing her boy gain in strength from bath to bath was very faithful in carrying out the treatment. Before the fever had disappeared the tongue had almost cleared off and the patient was longing for meat, which of course was not given to him.

CASE XXIII. was a fatal case. *Mrs. O.*, a rather plump woman of about 45. She was not taken care of as well as my other patients, and there being no symptoms but high fever T. 104 P. 120, when she came under observation I hesitated to use the baths for some days, at that period of my experience not being willing to treat any case where the diagnosis was not sure. I do not think that she received more than 12 cold baths.

CASE XXX. *Mr. Sch.* was also a fatal case. He was one of my worst cases, tried to keep on his feet (unloading iron-ore) while sick for several days; diarrhoea and high fever had developed when he came under treatment on the sixth day. Although bathed properly—, he had 52 cold baths in the first seven days—. I succeeded very indifferently in depressing the curve and as soon as we had lower temperatures (103 F.) the patient refused to be bathed any further; whereupon the temperature went up again. Although the baths were during the second week not omitted altogether, yet the energy of the attendants—to act against the wish of the patient—gave out, so that not as many baths were given as was necessary. Nor was I successful in checking the diarrhoea, in spite of the compresses. Finally the bathing was refused altogether and I withdrew from the case. While attending there had been blood in the discharges, so that I was not surprised to hear that he had died from “peritonitis”.

CASE XL. *Miss Z.* a teacher in the public schools. Of this case I have the accurate record, which follows, showing that the number of baths were 134 given in 20 days.

Day of Sickness.	Highest and lowest temperatures Before Bath.	Average of the Maxima.	No. of baths.	Temp. of baths.
.....7	...103,5 .....101,5...	.....102,5	.....4	.....70
.....8	...104,0.....101,5...	.....103,5	.....8	.....72
.....9	...103,5.....101,5...	.....102,5	.....8	.....72
.....10	...102,0.....101,5...	.....101,2	.....4	.....72
.....11	...100,5.....100,0...	.....100,5	.....3	.....75
.....12	...101,5.....100,0...	.....100,0	.....2	.....75
.....13	...102,5.....101,0...	.....101,5	.....5	.....72
.....14	...104,0.....101,5...	.....102,5	.....6	.....70
.....15	.. 103,5.....102,5...	.....103,0	.....7	.....68
.....16	...104,0.....102,0...	.....103,2	.....8	.....68
.....17	...104,0.....103,0...	.....103,4	.....8	.....64
.....18	...105,0.....103,5...	.....103,8	.....8	.....64
.....19	...104,5.....103,2...	.....103,9	.....11	.....64
.. .....20	...103,0.....101,0...	.....102,0	.....11	.....64
.....21	...105,0.....102,0...	.....103,5	.....10	.....64
.....22	...104,0.....103,0...	.....103,3	.....11	.....64
.....23	...103,5.....101,5...	.....102,5	.....9	.....64
.....24	...102,5.....100,0...	.....101,1	.....5	.....64
.....25	...102,0.....100,0...	.....101,1	.....4	.....77
.....26	...101,0.....100,5...	.....100,5	.....2	.....80

This case was of interest to me on account of a number of practical points connected with it. In the first place, it is the case which required more baths and cooler baths than any other in my practice. In the second place, I was somewhat loath to commence the process, because having been consulted by the patient previously, I was a little apprehensive of tubercular trouble, knowing that I would have to hear the odium of having done harm to the patient if developements in this direction should take place. When she came under treatment she was ill 4—5 days and no pathognomonic

symptoms then were present, although vomiting and purging had opened the scene. Nevertheless when on the sixth day the evening temperature went up to 104, we commenced to bathe, and after three days of energetic treatment had the satisfaction of seeing the fever decline. At the same time a little blood appeared in the passages, which aided in establishing the diagnosis. Along the 10th — 12th day perspirations appeared with general improvement, so that the bath tub was sent away, some baths were afterwards given in a stationary tub.

As the table shows, from the 13th day on there was an increase of the temperature, at the same time the pulse, which during the first ten days had kept below 120, went up to over 140. The tub having been brought back, the baths were given exactly according to the formula and even cooler. The fever was obstinate. After the bath the reduction of the temperature was two and more degrees which was ample, but the previous high temperature was again reached too soon. The number of baths were increased so that eleven were given and on the following day there was a lowering of the maxima.

The third point of interest in the case was, that too much alcohol was administered along this period. I had ordered two table-spoons full

of whiskey with each bath, instead of which about three times the amount was given. The patient grew hysterical, sentimental — was greatly excited and refused to take her baths, while whereas during the first 8—10 days the patient took an interest in the accurate administration of the method. Hence great excitement in the house. And I am certain I would not have been able to continue in my course, had it not been for the excellent nurse, whom I had trained in a former case, and who had taken charge of this case, and this is the fourth point I wish to touch upon. There are cases, that can not properly be treated without a good nurse. A good nurse for this method however must not only have the good qualities of nurses in general, she must have two other special ones: She must be commanding and determined in her make up, not yielding to the whims of the patient but able to exert gentle force, further she must have entered somewhat into the spirit of the method, so that she in the absence of the physician, as Brand points out, can take his place. Having had but little experience with women under an overdose of spirits, I failed to recognize the cause of my patients condition. But when I did, and the alcohol was diminished, she became quiet, but her pulse did not go down until the disease declined,



It was surprising to see after the fever had left the patient, in what excellent condition she was. Her friends could not help remarking, that she had not in the least the appearance of a convalescent from typhoid fever. This of course was due to the excellent condition in which her digestive organs were kept under the influence of the baths. Her tongue always had but a thin coating, and her abdomen never was distended, although there was more gas there than normal — sufficient in fact to make the patient complain. — She thus was able to take a quart of milk and a good quantity of broth each day. Her urinary secretion was, as is frequent in the method, of light color and very abundant. There was no disturbance of the nervous system excepting the hysterical condition mentioned, due perhaps more to the alcohol than the fever. In spite of an acme of ten days there was no alarming symptom excepting the high pulse.

CASE XLII. *O. Sch.* a boy 3 years of age, whose aunt living in an adjoining house, had died of typhoid fever two weeks previously, came under my treatment after being ill about a week. Although not apparently gravely ill then, he had diarrhœa, tympanites, enlarged spleen, a temp. of 104 and had not slept for four nights. After the first bath given in the

evening, he slept one hour and after the third for several hours, and kept on improving from the first day of treatment, so that the parents were delighted and did not heed the crying of the child, but carried out the treatment most accurately. The appetite of the patient returned after 4—5 days of treatment, and while the spleen was still swollen and rose spots were present, he had only occasional outbursts of the fever and was hungry. We gave baths of 72 of 10 minutes duration; the first days six were necessary and later fewer. He required about 40 of them.

From this house the bath-tub was taken to a four year old patient, who received 27 baths. She had a croupous pneumonia. I gave the baths before the diagnosis was established, and when on the 4th — 5th day chest-symptoms developed, we continued the baths, which acted very pleasantly and produced sleep. The temperatures in this case were 104—105, and the pulse 156, which after the baths would fall to 128.

CASE XLVI. *Miss K.* The baths acted as they should, 52 baths were given, no medicines were required not even an opiate at night. I was very much amused at the mother, by no means a person of sanguine temperament, relating to me the good points of the water treatment in contra distinction to the ordinary treatment,

the properties of which she was acquainted with in as much as she had been nursing two of her children some time ago, who had typhoid fever. — Had she been reading this book she could have not done better in calling attention to the good points of the hydriatic treatment. She was converted.

CASE XLVII. *Aug. Th.* was of much interest to me because it was a case coming under the water-treatment late. It was a boy  $9\frac{1}{2}$  years old, ill 3–4 weeks, when seen, perfectly unconscious, throwing himself around in the bed, and crying out so that the neighbors were disturbed. Perhaps he was not as seriously ill as he appeared to be, as his pulse was not 120, but it was a pitiful sight to see the child and to listen to his outcries. The parents were informed that the child had no more fever and that he only “had” it in his head; this assertion I suppose was based on thermometric measurments *not* made in the rectum. At least, for the next week I found the temperature to vary between 103 to 100.—There was some cough, and three superficial bedsores varying from the size of a dollar to that of a nickel; bowel symptoms were not marked, pupils widely dilated,—Temperature 103 when I saw him at 9 p. m. and 101 two hours later.—As we were evidently near the end of the disease, cold baths seemed not indicated,

and I gave him a bath of 90° F. and towards the end, the bath lasting 10 minutes, used two pails of water of about 70 in affusions to the back of the head and back, after taking him from the bath I gave him  $\frac{1}{8}$  grain morphine, and in about  $\frac{1}{2}$  hour he slept quietly for several hours. Three hours after the first bath a second one was given followed by four hours of sleep. The bathing was repeated every three hours, the temperatures of the water having at times reduced to 85 and 80 if the fever went up to 102 or 103. As the patient was restless some time after each bath, I had in the third day given the baths only every six hours and had each bath prolonged to 15 minutes; he also took  $\frac{1}{8}$  gr. morphine 2-3 times a day. On about the seventh day he again became restless, although not so much so, as before the water-treatment was begun, in spite of taking more of the opiate. I then ordered a warm bath of 95°, without affusions, of 30 minutes duration, with five grains of chloral and  $\frac{1}{12}$  gr. of morphine before the bath, and if necessary a second dose after the bath. This modification of the treatment was followed by quiet sleep, and was kept up; and proved sufficient to produce sleep and a quiet condition. The bronchitis disappeared in the first week of treatment, and the bedsores healed, and sweating set in, the patient making a good recovery.

Together with this boy I began treating the father, sick only three days. Having my excellent nurse in the house he was treated accurately, receiving 41 baths in six days,—for three days at 64°, when the fever was subdued, and he made a rapid recovery.

CASE XLIX. *Aug. L.* 3½ aet. was a fatal case. He had been able to be out doors two days before he came under treatment. The method was carried out well, large reductions of temperature being produced by the baths, and the fever curve being lowered, when on the 10th. day of treatment a (pyaemic) swelling over the parotid developed, and the child died on the following day, having received over 50 baths.—This case has discredited the method in my eyes more than any other. Although the tympanitic condition of the abdomen and the pronounced diarrhoea, which were present, when the patient came under treatment, make it probable that the disease was progressed further than two days, when the water-treatment was instituted, yet the case was not a late one either, and the 50 baths though reducing the fever and unproving the diarrhoea, did not prevent the blood-changes.

CASE LI. *Mary L.* Sister of case 49 is of interest because she was bathed from the very first days; the parents, although having not



saved the first child, being satisfied that the method was a good and useful one carried it out accurately. 65 baths were given. I look upon this case as one of medium gravity. The following table shows the number and temperature of baths etc. No diarrhoea.—Pulse over 120.

	Highest Temperature.	Lowest Temp.	Average of Maxima.	No. of baths.	Temperature of baths.
1	....104.....	...100....	...101.75...	...3...	.....75.....
2	....103.....	...100....	...101.50...	...3...	.....72.....
3	....102.5.....	...101....	...101.75...	...5...	.....72.....
4	....103.75.....	...100....	...101.5....	...4...	.....68.....
5	....104.....	...102....	...103.....	...7...	.....68.....
6	....105.....	...102....	...103.25...	...7...	.....68.....
7	....105.....	...103....	...104.....	...7...	.....68.....
8	....104.....	...102....	...103.....	...7...	.....64.....
9	....104.....	...102....	...103.....	...7...	.....64.....
10	....103.....	...101....	...102.....	...6...	.....64.....
11	....103.....	...102....	...102.25...	...5...	.....64.....
12	....102.....	....99.5...	...100.5....	...3...	.....64.....
13	....102.....	....97....	...100.....	...1...	.....64.....
14	....100.5.....	....95.5...	...98.....	...0...	.....0.....

CASE LII. *Anna L.* 8 aet. sister of case 51, was also treated systematically from the second day on. I look upon this case as a grave one. Although baths of 64° were used from the beginning on the 8th and 9th day delirium and involuntary evacuations were the symptoms necessitating the repetition of the baths every 2 hours. The baths were of 12 to 13 minutes duration, 104 baths were given, 50 of 64° and the balance of 70°. Although I allowed after the

combat with the fever was over warmer baths than 70, the mother preferred them not above 70 she noticing that the colder baths did more good. In this case the pulse went up to 144 and over. I add a table illustrating the treatment and character of the case.

Day of Treatment.	Highest Temperature.	Number of baths.	Temperature of baths.
1.....	104.....	4.....	64.....
2.....	105.....	6.....	“ “.....
3.....	105.....	7.....	“ “.....
4.....	104.5.....	8.....	“ “.....
5.....	104.5.....	9.....	“ “.....
6.....	104.5.....	9.....	“ “.....
7.....	104.....	9.....	“ “.....
8.....	104.....	7.....	“ “.....
9.....	102.5.....	1.....	“ “.....
10.....	103.....	3.....	70.....
11.....	103.....	5.....	“ “.....
12.....	104.....	5.....	“ “.....
13.....	103.5.....	4.....	“ “.....
14.....	103.....	4.....	“ “.....
15.....	104.....	5.....	“ “.....
16.....	103.....	4.....	“ “.....
17.....	103.....	3.....	“ “.....
18.....	103.5.....	5.....	“ “.....
19.....	103.....	2.....	“ “.....
20.....	103.....	2.....	“ “.....
21.....	103.....	1.....	“ “.....
22.....	103.....	1.....	“ “.....

If asked regarding the value of the water-treatment I would answer, that as far as my individual experience goes, I can say, that I know of no combination of remedies in or out of the pharmacopoeia (including the expectant treat-

ment) that has the same effect for good or produces such good results on the symptoms. I therefore expect that more cases of typhoid fever will recover under the cold-water-treatment than under any other plan.

As far as the action on the individual symptoms is concerned I have in the majority of cases seen the effect on the fever curve which Vogl describes, and where I have not seen it a more rigorous treatment might have brought about the change. Thus in a case where the temperatures were 104.5 and 104 the first day, there would be no change the second day, on the third day 104.5 would appear not so often on the record, and instead of that 103.5 perhaps once or twice, on the fourth day 104.5 had disappeared, and the figure 3 was seen oftener on the record, finally the 4 would disappear and the 2 would present itself, so that one or two baths could be omitted.

A reduction of the frequency of the pulse I have seen often, but not always.

Thus in case No 48, a man, where 41 baths were given in six days, and where the method was carried out to the letter the pulse was 100 before the bathing and remained at that figure throughout the fever. In women and children likewise I do not recollect having seen marked changes in the pulse. The effect on the nervous system was satisfactory, my

patients resting quietly or sleeping between the baths. For the night however I generally gave and often had to give a suppository of morphine. The effect on the urine, the polyuria, I have observed very often, and where that was not the case, it may have been due to the patient not drinking enough. I always felt as though I had the best of the disease, when the urinary secretion was abundant, being of the opinion, that a normal blood pressure is necessary for its existence. Of course there were no dry lips and tongue, the latter generally being but thinly coated and an amount of nourishment could be taken, greater than could be taken by my patients under medicinal treatment. Where I was most disappointed was in the action of the water on the bowels. In three cases of diarrhoea the effect seemed to be almost nothing in spite of compresses well applied. For at present however I do not feel like calling to account the method for these or any deficiencies. It may be that it was lack of skill on my part, and that, these being my first years of trying the method, I was to blame.

I have since January 1890 treated 54 cases of typhoid fever with water, and have had amongst these three deaths, I have had besides 26 mild cases, of which some had some baths, but I put them down as not treated hydriatically, of these

I lost one case. Of three cases, which I saw in consultation, none of which were bathed, all three died. Besides that I saw a moribund case and a case that had died before my first visit. The mild case which I lost was a case with good pulse, temperature below 103, diarrhoea marked but not excessive, In the 4th week he had profuse intestinal hemorrhage, probably perforation and succumbed. Although I should feel very doubtful if such a case could be carried through safely by the water-treatment, if one were called as I was here, after the disease had been fully developed, I should however, if I had to treat the case over, treat it hydriatically, not however according to the formula. I should give about 4 baths of 70—72 daily of 5—10 minutes duration, with thorough rubbing, or use the cold affusions in the luke-warm half-bath, 5—10 minutes duration, with compresses to the abdomen, knowing however, that I should have to bear the odium of having produced the hemorrhages, if they should take place. The family of course would say: the disease was so mild, that the patient would have surely gotten well, had it not been for those cold baths. The two cases which refused the baths also died. The second one was seen when ill a few days. He seemed so little depressed by the disease, that I rather expected he would have the disease in a



mild form; four to five weeks later his mother met me on the street and expressed her regret, that the water-treatment had been refused. About a week later the patient died. This case again emphasizes the rule to treat all cases with water, though they may appear mild.

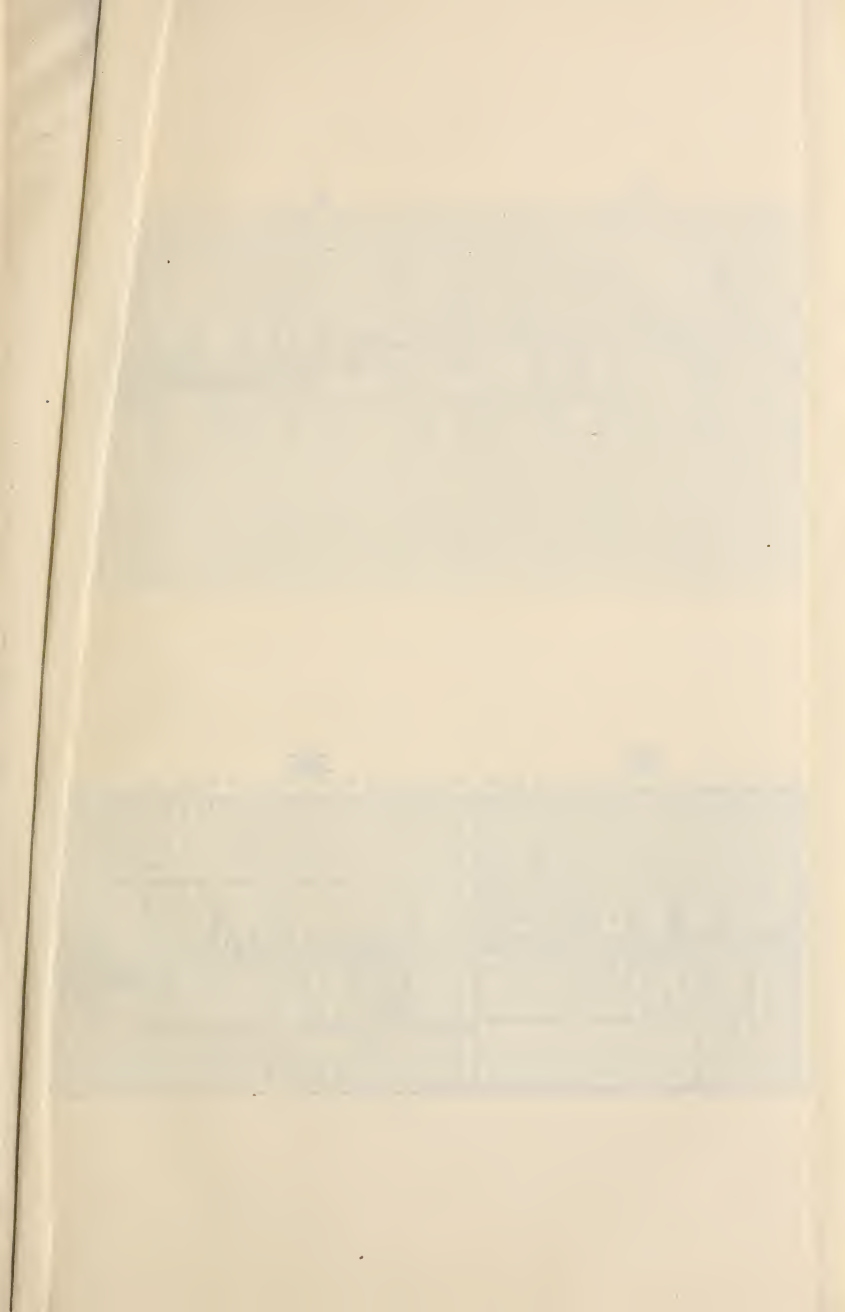
Of course I shall continue using the method and employ it more thoroughly and extensively. I for my part feel very grateful to *Brand* and to *Jürgensen*, *Vogl*, *Tripier* and *Bouveret* and others, who have followed him, for enriching our armamentarium with this method. Every physician must have execrated the day on which he decided to study medicine, when he comes to see and feel the great dearth of reliable therapeutical resources, and the formidable powers of disease; hence one should have expected, that the hydriatic method would have been hailed with delight. Whether one can save every case that comes under treatment in due time, by this method, I do not know. — I find it too difficult to believe that —. But even if that is not the case, so much is certain, that with this method a powerful means for doing good is placed in the physician's hands, and I would no more think of placing any one dear to me personally, suffering from typhoid fever, into the hands of a physician, who does not act according to the principles of *Brand*, than one who had to undergo an opera-

tion, into the hands of a surgeon, who does not act according to the principles of *Lister*.

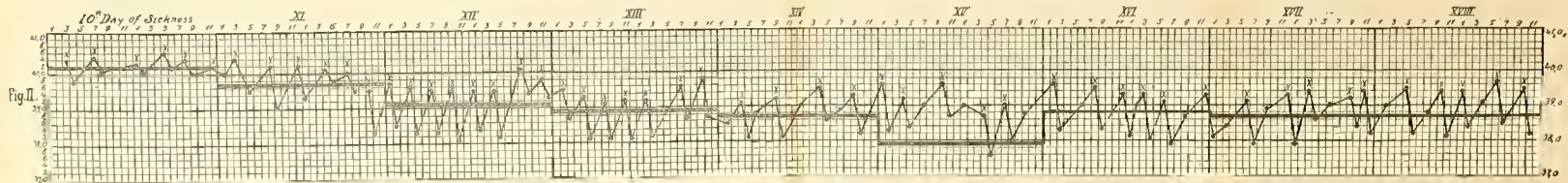
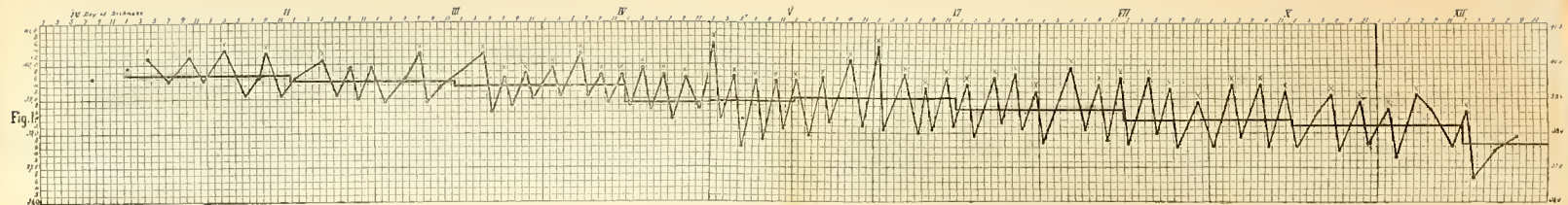
I conclude this little volume with the following words of Vogl: "In as much," Vogl says, discussing the question, whether the method should be made obligatory for the military physicians, "as I am not in favor of any restraint upon the practice of medicine, I should discourage any sort of outward compulsion which necessarily must remain useless, if met by insufficient inward conviction. The moral compulsion however to form an opinion on the usefulness of a method, no medical man can avoid, and this compulsion will induce him to give the same a trial. With the recognition of the harmlessness of the same, his courage and self-reliance and together with these his success will grow, forming the basis for his conviction.

This road every physician must travel for himself, in order to reach the truth. He must not allow the less brilliant results of the first year of his trial to be a reproach to himself, or the cause of the discontinuation of the method.

The physician however, who has become convinced of the life-saving power of the method and has not the courage to combat all obstacles, does not stand on the pinnae of his profession."











HOURL.	
<i>Night.</i>	
12	Day of Disease.....
1	Av'age Reduct. Tem. ....
2	No. evacuations.....
3	Abdomen, Character of dis-
4	Spleen. — Roseola, Sweating.
5	.....
6	.....
7	.....
8	.....
9	.....
10	.....
11	.....
<i>Noon.</i>	.....
12	.....
1	.....
2	.....
3	.....
4	.....
5	.....
6	.....
7	.....
8	.....
9	.....
10	.....
11	.....



HOUR.	MINUTE.	TEMPERAT. OF PATIENT.		BATIL.		PULSE	Name. (age.)
		BEFORE B.	AFTER B.	TEMP.	DUR.		
Night.							Date
12							Day of Treatment.
1							Day of Disease.
2							Average max. Tem.
3							Average Reduct. Tem.
4							Quantity urine
5							No. evacuations.
6							Remarks: Sleep, Delirium. — Abdomen, Character of dis-
7							charges. Cough, Sputum. — Splen. — Roseola, Sweating.
8							Medication. Diet etc.
9							
10							
11							
Noon.							
12							
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							





Day of tr							
Day of di							
.....1							106
.....1							105
.....1							104
.....1							103
.....1							102
.....1							101
.....1							100
.....							99
.....							98
Pulse .....							
No. evacu							
Urine oz.							
No. of bat							
Temp. of							
Average r							
Epitome: Result.....							
Disease, Temp. of baths .....							
dominal							
symptom.....							
.....							
.....							
.....							





















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